

COMPUTERWORLD

Webmasters

Young cyberwizards strive to conquer on-line world

By Kim S. Nash and Thomas Hoffman

Brace yourselves, IS managers. The World Wide Web has bred a crop of technical whippersnappers who think art is as important as command-line programming. And they want to be masters of the on-line universe.

Who are these webmasters? When they're not marketing folks, they're *you* — only more creative, less by-the-book, often several years younger and quite comfortable with the heresy that data doesn't have to reside under lock and key.

Webmastery, in fact, can be a little mystical for information systems folks used to down-and-dirty programming or systems administration, according to the 30 users and analysts recently interviewed by *Computerworld*.

Robert Holt, for example, is the webmaster. **Webmasters, page 32**

Hire twenty-somethings for Web work, says UPS' Josh Cohen



Lily Dowe

3Com hub users say they'd rather fight than switch

By Bob Wallace

With its acquisition of Chipcom Corp. now complete, 3Com Corp. last week detailed business and product plans that raised concerns among users of both vendors' networking products.

Though the deal makes 3Com the second-largest internet-working vendor behind Cisco Systems, Inc., some users have



Manager Steve Lopez: *'We don't want 3Com to get distracted by the merger and have resources siphoned off to Chipcom'*

reservations about its product positioning and network management plans. Even basic business issues such as distribution strategies are worrying some users, according to several customers interviewed last week.

3Com's decision to position Chipcom's high-end Oncore Switching System as its flagship all-purpose **3Com, page 16**

Win 95: Better read the manual!

By Laura DiDio

The adage "forewarned is forearmed" is haunting scores of users who didn't properly prepare for the integration of Microsoft Corp. Windows 95 clients with Novell, Inc. NetWare file servers.

Users who didn't do their homework by implementing test networks and referencing the Windows 95 Resource Kit are now suffering the consequences.

Even a month before Windows 95's late August ship date, 65% of 100 information systems professionals surveyed by *Computerworld* had no implementation plans ready.

The price for such lack of preparation ranges from minor printing problems to major net-

work and system crashes, lockups and security breaches. In the past month alone, nearly 10,000 users posted technical queries on Microsoft's Windows 95 and Novell's NetWare forums on CompuServe and Internet newsgroups.

The irony of the situation is that Windows 95 itself has been relatively bug-free in its first two months of release. In fact, Microsoft has "no plans and no need to do a maintenance release to correct problems," said Rob Bennett, product manager at the Personal Systems group (see story, page 2).

Most of the problems aren't caused by any inherent flaws in Windows 95, said Jeff Thiel, group manager for Windows 95, and Clark Heindl, a Win

Win 95, page 143



wins respect

The new kid on the networking block has gained some fans. Lab tests and user interviews position Windows NT as a viable alternative to long-time network operating system leader NetWare. NT beat NetWare in some lab tests and posted several big wins in a Computerworld customer satisfaction survey of network operating system users.

CW Guide, page 105

OVERALL SATISFACTION

Microsoft Windows NT	78%
IBM LAN Server	73%
Banyan Vines	71%
Novell NetWare	60%

(Percentage of users rating their vendor "good" or "very good."
Base: 208 users.)

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News

NEWS

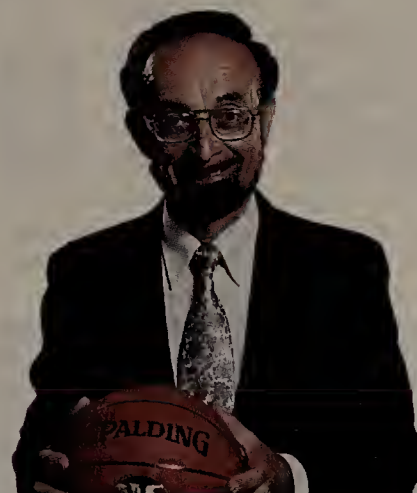
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Turning dreams of access into reality comes naturally in Hollywood. Just ask CIO George Brenner as he offers a studio tour of MCA's executive information system.
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Choice Cuts

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Information systems professional David Baer has a love/hate relationship with C/C++: He loves its power but hates its complexity.
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IBM's bundling of MVS with several supporting products promises to alter the whole software fabric of data center life. Mainframe shops should benefit from lower software prices and shorter installation and testing cycles, but they must first put their faith in IBM's integration skills.
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AT&T GIS joins NT cluster bandwagon

Add-ons to expand backup and availability

By Jean S. Bozman
BOSTON

AT&T Global Information Solutions will deliver new clustering technology in the form of add-on software modules for its Microsoft Corp. Windows NT servers by year's end, senior AT&T GIS executives said last week. A formal announcement may come as soon as next month.

The company's LifeKeeper modules, which now run only on its Unix servers, will add the ability to cluster two or more NT servers for backup and high-availability purposes.

NT clustering is important to users because it would mean more uptime for NT servers used as LAN servers.

The news comes just one week after Microsoft announced it is forging a set of Microsoft-centric clustering application programming interfaces (API) for NT with six systems vendors, including

AT&T GIS and Digital Equipment Corp. [CW, Oct. 16].

The Microsoft APIs will allow software vendors to write "cluster-aware" applications that can be broken up to run on multiple servers. The Redmond, Wash., company gave no dates for the availability of the APIs, however.

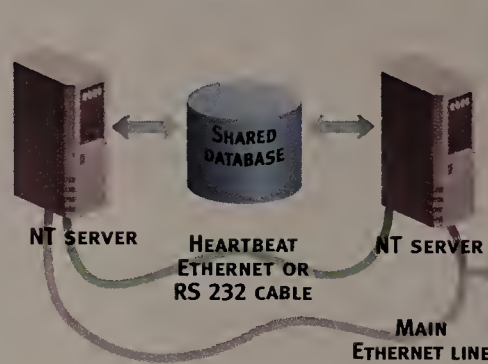
Over time, Microsoft also plans to build clustering into its NT kernel [CW, Oct. 16].

Add-on anticipated

The AT&T GIS clustering technology will be delivered as add-on software modules with the company's hardware servers, said James E. Clarke, vice president of AT&T GIS' software and communications solutions group.

AT&T GIS plans to ship its fail-over clustering module, which allows one NT

How AT&T GIS' LifeKeeper works on NT



Fail-over clustering allows an NT server to take over if the first one fails. A "heartbeat" Ethernet line or RS 232 link notifies the second server that the first server is off-line.

server to take over for a server that has failed, late this year. A shared-memory clustering module with a distributed lock manager to prevent users from erasing shared disk-drive files is set to ship next year. The fail-over module goes to beta testing later this month.

"If we could do a backup type of environment with shared disk, it would be of interest, absolutely, because all of our LAN servers have their own disk today,"

said David Barrett, vice president of information technology architecture at Invesco Funds Group, Inc., a mutual funds investment firm in Denver.

The company has six Windows NT servers from AT&T GIS and Compaq Computer Corp., which support LANs with 550 end users. It also has AT&T GIS high-end Unix servers, including the NCR 3600, for large database applications.

But industry analysts warned that AT&T GIS has a short window for getting its clustering software widely adopted before Microsoft follows suit with clustering in NT.

"In 1997, we expect Microsoft to be introducing a clustering product that is internal to NT," said Scott Winkler, an analyst at Gartner Group, Inc. In the meantime, AT&T GIS is "going to get serious competition from Digital and others in clustering," he said.

IBM links DB/2, Lotus Approach

Integration to ease support, development issues for IS

By Cheryl Gerber

IBM last week staged a sneak preview of the links it has forged between its mainframe DB/2 database and Lotus Development Corp.'s Approach desktop database for Windows 95, which is slated to ship by the end of the year.

IBM/Lotus showed the integration at the DB/2 technical conference in Nashville. Through the links, users can join DB/2 to other data types, such as those of Oracle Corp. databases and Notes groupware, said an attendee who requested anonymity.

Approach 96 will be available when IBM/Lotus begins shipping the 32-bit SmartSuite 96 by the end of the year. Although the company hasn't yet priced SmartSuite 96, its biggest competitor — Microsoft Corp.'s Office for Windows 95 Professional version — costs \$600. The current stand-alone version of Approach is priced at \$129; the current suite version, Lotus SmartSuite 4.0 for Windows, costs \$399.

The link between DB/2 and Approach could help information systems departments with support and development. "Users who have trouble doing complex [database] joins end up going to the IS department for help," said Michael Edel, an attendee and database administrator at ARDIS Co., the Motorola, Inc. wireless division in Lincolnshire, Ky. "But you could probably even give this to the accountants, and they could do complex joins without having to ask for help."

Edel said the ARDIS financial systems are Oracle-based, while the company's operational and network data is in DB/2. "There's no way, other than unloading the data and importing it,

that we can get that connectivity [between the two]," he noted. "But we can do that with the Approach DB/2 links I've seen here."

IBM/Lotus showed off a trio of new features in the 32-bit version of Approach, called Approach 96: SQL Assistant, enhancements to data analysis and TeamMail.

SQL Assistants are tabbed interfaces that walk users through the process of extracting specified information from DB/2 or other databases. Enhancements to data analysis include the ability to drag and drop DB/2 fields from within Approach to create cross-tab reports. TeamMail provides the ability to send or route a report done off DB/2 data via electronic mail, the attendee said.

GIS market benefits

One Approach user is now building remote sensing applications for geographic information systems (GIS). The GIS market could benefit from the integration of DB/2 and Approach by providing easier access to the large database system, said Stacy Myers, a consultant and professor at Nova Southeastern University in Dania, Fla.

IBM hopes the integration between the two databases will boost stand-alone sales of Approach as well as improve its strategic position in the market.

"You now have from IBM a complete data management story from the desktop to the mainframe. No other vendor has that yet," said Nicole Miller, an analyst at International Data Corp.'s Mountain View, Calif., division.

The DB/2 links are also needed for SmartSuite, given that the 32-bit version of the suite's popular 1-2-3 spreadsheet will not be ready when the next version of the suite ships.

"You could probably even give this to the accountants, and they could do complex [database] joins without having to ask for help."

— Michael Edel,
ARDIS Co.

Microsoft claims sales of 7 million for Windows 95

By Stuart J. Johnston

Less than two months after shipping Windows 95, Microsoft Corp. claims to have sold 7 million units. The company also said it won't ship a maintenance release of the system, which may cause some corporations to delay purchase a while longer.

Microsoft has "got to get over that mind-set. Mainframe IS shops never buy until [a new system] comes out with a .1 [maintenance] release," said Rob Enderle, an analyst at Dataquest, Inc. in San Jose, Calif. "I don't think Microsoft will see the volumes they want [in the corporate market] until they do."

However, Microsoft claims the initial release is so clean it doesn't warrant a maintenance release. Moreover, possibly venturing into semantics, Microsoft draws a distinction between a maintenance release and its planned "service packs," which it formerly referred to as "tune-up packs," said Rob Bennett, product manager at Microsoft's Personal Systems group.

The service packs will include new capabilities and utilities such as the Novell, Inc. NetWare Directory Services client that Microsoft made available on-line last week. Other forthcoming tools will include Integrated Services Digital Network and infrared device sup-

port for Windows 95. If any minor bug fixes are made, they would also be included in the service packs, Bennett said.

The first of the service packs will probably come out early next year, Bennett said. Initially, they will be available only on-line.

Meanwhile, sales of Windows 95 to date match Dataquest's aggressive projections of 20 million units for calendar 1995, Enderle said. If sales continue at the same or higher levels, Microsoft will hit or come close to Dataquest's estimate, he said.

The 7 million units that Microsoft said it has sold comprise 3 million shrink-wrapped packages and 4 million new PCs bundled with Windows 95, said Brad Chase, general manager at the Personal Systems group.

Meanwhile, executives at Microsoft's Product Support Services organization claim the crush of calls to the company's technical support lines has subsided to a manageable level. "Since about the first three weeks we haven't had any busy signals, and the wait before a user gets to talk to a support engineer is now less than 60 seconds," said Deborah Willingham, vice president of support.

The Microsoft Network has some growing up to do. See page 67.

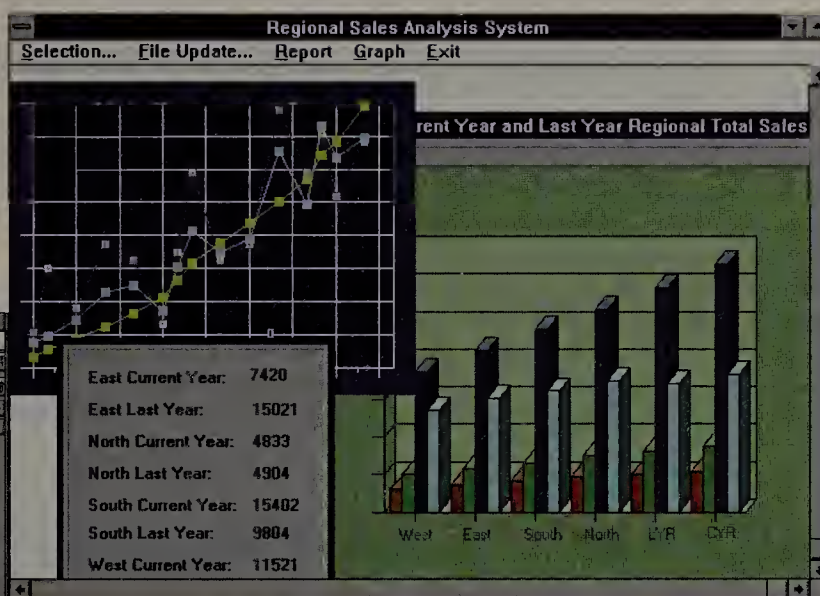
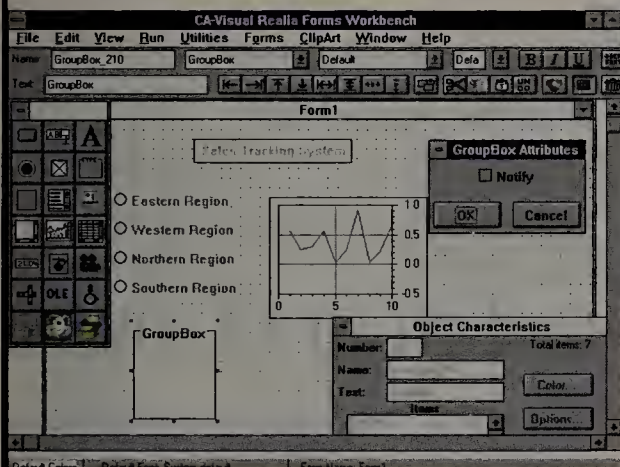




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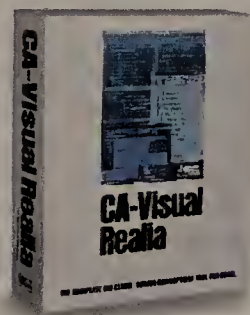


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Apple is dreaming of green Christmas

Company must first address severe backlog

By Lisa Picarille

Apple Computer, Inc. can't afford to be the Grinch who stole Christmas.

As the lucrative holiday buying season moves into full swing, shoring up Apple's bottom line and fixing its recently tarnished image [CW, Oct. 9] will depend heavily on selling a lot of its Performa brand of consumer Macintoshes — even if other Macintosh models remain hard to get, according to industry watchers.

While product shortages are nothing new to Apple, the situation has worsened recently, and Apple's backlog of orders has ballooned to outrageous proportions — more than \$1 billion. Michael Spindler, Apple's president and chief executive officer, last week told financial and market analysts that he expects the backlog problem to be resolved by early next year.

Chip dip

Apple attributed its supply problems to a shortage of key components, including quad-speed CD-ROM drives, dynamic RAM, application-specific integrated circuit chips and PowerPC 601 and 604 chips. Observers claim Apple is working

on fixing its forecasting problems to ensure it gets the components it needs.

"There are availability issues across the board, and we are working to get product out there," said a spokeswoman for the Cupertino, Calif., company.

Consequently, users trying to purchase some of Apple's popular Power Macintosh models are frustrated. Apple's 604-based Power Macintosh 8500 models, which include support for digital audio and video, are on back order for at least a month. Supplies of the Power Macintosh 7200 series and the PowerBook 5300CE are also tight. It takes about three weeks to get these models, according to dealers, retailers and potential buyers.

"Take my money, please," said a graphics designer at a San Francisco publishing house, who asked not to be named. "I have the cash and want an 8500, but I can't find anyone to sell me a system."

However, industry watchers say it is imperative that Apple concentrate on having enough consumer systems available, even if it is at the expense of corporate users.

"The 8500 buyer will wait for a couple

Apple heal thyself?		
Symptoms	Diagnosis	Apple's home remedy
Copland and OpenDoc are late	Overestimated delivery date and bug problems.	Better late than never.
\$1B backlog of Power Mac 8500, 9500 and 6100	Shortage of key components such as quad-speed CD ROMs, DRAM and 601 and 604 chips. Chronic bad forecasting.	Move to standards such as PCI to increase suppliers.
Miscellaneous mishaps	PowerBook 5300 overheats and bursts into flames.	Replace batteries with nickel-hydrate batteries.
Financial woes	Q4 profits fall 48% from Q4 1994.	Continue to reduce gross margins and increase units shipped.
Declining market	Share falls to 7.2% in 1995 from 8.3% in 1993.*	Cut Macintosh pricing, increase number of Mac OS licensees.

*According to Computer Intelligence InfoCorp

of weeks if they have to. So that is deferred revenue" for Apple, said Pieter Hartsook, editor of "The Hartsook Letter," an industry newsletter in Alameda, Calif. "But the guy who goes into a store to buy a Performa for his kid for Christmas won't wait. If there are no Performas, he'll say, 'What else do you have?' That revenue is lost."

And right now, Apple can't afford that. Last week, the company reported that earnings for its fiscal fourth quarter, which ended Sept. 29, tumbled by 47.6% compared with the same quarter last year.

Rise in shipments

Still, demand for Apple products has increased. The company raised its fourth-quarter Macintosh shipments by 25%, to approximately 1¼ million units, over the

same period a year ago. Apple is attempting to further boost sales and sagging market share by competing head-to-head with IBM and Compaq Computer Corp. on price.

"Their belief is that the best opportunity to grow market share is eliminating the perception that Macs are more expensive," said Kurt King, an analyst at Montgomery Securities, an investment banking firm in San Francisco. "Expect very significant pricing actions in the near future."

But if Apple can't deliver the products, price may be moot.

"People still want Apple products, but there will come a point where people won't wait forever," said Joseph Ferlazzo, an analyst at WorkGroup Technologies, Inc., a market research firm in Hampton, N.H.

NetWare 4.1 component flawed

Bug found in some copies of Novell software licensing kit

By Laura DiDio

Novell, Inc. executives last week acknowledged a flaw in several thousand copies of the licensing part of the company's fault-tolerance software for NetWare 4.1. The error, which the executives said has been fixed, allowed only a single user on each server to get

the fault-tolerance features.

The software, called the System Fault Tolerant III Licensing Kit (SFT III), provides users with mirrored servers to replicate data. It is said to give businesses full server redundancy and 100% uptime.

Bad batch

Michael Bryant, Novell's product marketing manager for SFT III, said a manufacturing error occurred in a batch of about 5,000 copies of the licensing piece for SFT III. The licensing code is supposed to give full disk-mirroring capability to all users attached to a corporation's servers.

Bryant emphasized that there are no problems with the underlying SFT III code, which is integrated into every copy of NetWare 4.1, and said that only about 24 customers have been affected by the problem.

The flaw has been fixed, and all of the affected users have "clean copies of the diskette," he added.

With the exception of the 24 flawed diskettes that wound up at customer sites, an overwhelming majority of the 5,000 affected SFT III licensing diskettes remained unsold "in distributors' warehouses on the West Coast," Bryant said.

Novell did not provide the names of any of the users who experienced the problem.

But Michael Goulde, a senior consultant at Patricia Seybold Group in Boston, said that "if only 24 customers were affected out of 5,000, it indicates that very few users are utilizing the SFT III functionality in NetWare 4.1 to support mission-critical applications."

A Novell spokesperson said the company "conservatively estimates that 10% to 20% of the installed base of 6 million NetWare 4.1 nodes are utilizing SFT III."

Pentium price reductions prompt shift in PC market

By Jaikumar Vijayan

Relentless price cutting on Intel Corp. Pentium chips has shifted some high-end 120- and 133-MHz Pentium-based configurations into the sub-\$2,500 mass-volume market.

"Intel's idea is to move the volume space to the 120-MHz by year's end," and system vendors are responding by passing the price cuts to customers, said Joseph Ferlazzo, an analyst at WorkGroup Technologies, Inc. in Hampton, N.H.

For example, business PC announcements from Dell Computer Corp. and Hewlett-Packard Co. are based on these two chips.

New releases

Dell last week launched 24 PCs based on a wide variety of Pentium processors, including the 120- and 133-MHz chips.

The systems include the Dell OptiPlex GX line, which is the company's first line of desktops to of-

fer fully integrated multimedia capabilities in a corporate PC.

Prices start at \$2,310 for a 120-MHz system with 8M bytes of RAM, a 540M-byte hard disk, 2M bytes of video RAM and a monitor.

HP, meanwhile, will introduce this week its VL Series 4 PCs based on the same chips.

The minitower systems will sit on top of the company's Vectra PCs for business users and will feature high-end graphics capabilities, according to the company.

A 120-MHz system with 8M bytes of RAM and a 1G-byte hard disk costs \$2,105.

The falling prices are in line with market expectations of a sub-\$2,000, 120-MHz Pentium system by year's end, Ferlazzo said.

Wide availability of the 120-MHz chip will push systems based on the 90-MHz Pentium to the low end of the corporate desktop market.

HP will launch a program to buy back PCs and workstations beginning in January. See page 50.

Support is available

Users who find a bug in their SFT III Licensing Kits for NetWare 4.1 or their 2-User NetWare 4.1 Software Development Kit can get replacement software within 24 hours by calling Novell's technical support hot line at (800) NETWARE. Customers who need the kits immediately can ask Novell's technical support personnel to upload clean copies of the software to a secure bulletin board.

Database Performance

The TPC-C™ benchmark is the industry standard test for measuring database On-Line Transaction Processing (OLTP) performance. On July 24, Hewlett-Packard published the record-setting 5369 tpmC Oracle7 benchmark.

ORACLE7
BEST: 5369 tpmC

Informix
BEST: 3534 tpmC

Sybase
BEST: 1708 tpmC

ORACLE7 HP 9000 T500

5369

Informix Sun SPARCcenter 2000E

3534

Informix AT&T 3555

3312

Informix HP 9000 T500

3118

Informix Bull ESCALA Rack R201/8

2660

Informix HP 9000 K400

2616

Sybase Digital Alpha 2100 4/275

1708

Informix Bull ESCALA Rack R201/4

1562

Sybase Compaq ProLiant 4500 5/100

1516

Informix NEC UP 4800/690

1489

Informix DG AV 9500+

1416

Sybase HP 9000/800/H70

1403

Sybase IBM RS 6000 PowerPC J30

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Informix NEC UP4800/640

868

These are the top 20 Oracle, Informix and Sybase TPC-C benchmarks as of September 1, 1995.

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ITT eyes IS merger for \$1 billion boost

By Mitch Wagner

Linda Boardman heads up sales and marketing at the Sheraton Music City Hotel in the country music mecca of Nashville. Giving her an achy-breaky heart wouldn't be that hard.

"I would quit if they took my computer away from me," Boardman said, referring to her PC, which connects to the hotel's mainframe-based booking system.

From the Dark Ages

Until two years ago, the hotel still did its bookings by hand. But the addition of the automated system vastly increased productivity and customer satisfaction, Boardman said.

Now ITT Corp., the parent company of Sheraton and many other properties, has plans that will really give Boardman and her colleagues something to talk about.

ITT plans to add about \$1 billion to its \$7 billion annual hospitality and entertainment revenue by consolidating infor-

mation systems from about 50 business units into a single system, said Dave Starr, vice president and chief information officer at ITT. The new system will

asking ourselves," Starr said. "We need to use technology to get the different business units working together and to come up with new revenue sources."

ITT will spend \$60 million to \$70 million during the next two years to standardize on Oracle and PeopleSoft, Inc. applications running on Oracle databases. The company plans to make the money back in a single year of savings on duplicated resources, Starr explained.

ITT also will use the Oracle backbone to generate revenue through shared marketing and exchanging reservations data and customer preferences among Sheraton and Caesar's properties. "They'll know all about you from

your previous visits to any ITT property," Starr said. "They'll know what kind of wine you like and whether you want a smoking or no-smoking room."

The computer systems reorganization that Starr is managing is part of a larger plan to split ITT into three companies by year's end, including ITT Industries in

Harrison, N.Y., and ITT Hartford in Hartford, Conn. The information technology departments at ITT Industries and ITT Hartford will change very little, Starr said, because they already operate as independent business units.

There are 3,500 members of the information technology staff at ITT, and it will be left with about 500 people after the split. The total IS budget for this year was about \$750 million, with about a quarter of that heading for the new ITT.

Industry trend

Jerry Loev, president of Computer Sciences Corp.'s information technology management consulting unit in New York, said the consolidation of systems between hotels and casinos is sensible.

"In the case of travel and lodging, a lot of the things one needs in hotels and reservations have a fair amount of commonality," he said.

ITT is one of many companies in the travel industry looking to realign and centralize IS functionality.

Boardman said she favors centralization. "Right now, what I find a lot of the time is that there's not clear communications," she said. Often, the information technology staff doesn't know what kind of software is installed at individual hotels, she explained, so weeks can be lost tracking down solutions.



Caesar's Palace is among the ITT properties that will benefit from a system unified on Oracle and PeopleSoft applications

use Oracle Corp. technology, he said.

Besides the 430-hotel Sheraton chain, ITT owns Madison Square Garden in New York and Caesar's World resorts in Las Vegas, Atlantic City, Lake Tahoe and other gambling centers.

"Where is the next billion dollars going to come from" is the question we're

Users hit RS/6000 chip blockade

By Jean S. Bozman

Users about to hit the power ceiling on their IBM RS/6000 Unix servers will find a major upgrade path blocked until next year.

IBM announced its first symmetrical multiprocessor (SMP) Unix servers a year ago. They were based on the PowerPC 601 chip, and users who bought them were promised a free upgrade to the next version of the chip by the middle of this year. But IBM is running a year late with the promised PowerPC 604 upgrade, and customers will have to wait until the middle of next year.

Users were looking forward to 50% to 60% more power with the SMP upgrade.

Users who expected that new servers based on yet another advanced chip—the 64-bit PowerPC 620—would ship this year also will have to wait until next year while IBM re-evaluates its plans for that chip.

IBM quickly must clarify the upgrade issue with RS/6000 users, ana-

lysts said.

"I think it's fair to say that any delay in the 604 or 620 systems is cause for concern for their customers," said Tom Copeland, a Unix systems analyst at International Data Corp. in Framingham, Mass. "[Users] need to see a clear path of growth with the PowerPC.

If there is any problem with future generations, that could cause [users] to look to other Unix vendors."

Roy Dodd, information systems director at The Good Guys, an electronics store chain in Brisbane, Calif., is one user who expected to receive the promised free upgrade this year for his RS/6000 Model J30.

"I'm still going to get this freebie. It's just going to be later," Dodd said. His site has three large RS/6000 servers that run mission-critical inventory applications. Of his original two-processor J30 server, he said, "I've actually had to go buy some

more 601 processors to go in there."

IBM officials insisted there wasn't an upgrade crisis—at least not yet.

They said last week that users who are running out of processing capacity can buy more PowerPC uniprocessors or cluster several SMP servers together, until the new batch of high-end PowerPC chips arrives next year.

IBM also said its tests on the next generation of PowerPC 604 chips show that they are just as fast as the 620s. The faster 604E chips, which have up to 30% more power, also are due next year.

SMP sticking points

At the same time, IBM is having more trouble than expected gluing many PowerPC 604 processors together for the SMP Unix servers.

"It's just a matter of getting the SMP support chips put together," said Jeff Mason, vice president of RS/6000 worldwide marketing. "It has nothing to do with the availability of the 604." Uniprocessor 604 servers are shipping in volume now.

IBM's offer to sell alternative machines to users won't really address the RS/6000 server upgrade problem, said Bill Moran, a research analyst at D. H. Brown Associates, Inc. in Port Chester, N.Y. "It's really not good to get somebody to make business plans based on what you tell them and then go back and take the rug out from underneath them," he said.

Work around it

Some users are finding work-arounds while they wait for IBM to update its RS/6000 Unix servers with PowerPC 604 chips.

"We just went ahead and purchased 601-chip servers," said Caron Stein, computer department manager at Skidmore, Owings & Merrill, an architectural firm in Chicago. The company has more than 90 RS/6000s worldwide. Another strategy is to add more RS/6000 workstations to the corporate network to gain processing power, she said.

IBM has suggested that users buy an IBM SP parallel processor, which starts at \$90,000, or a clustered RS/6000 system with up to eight SMP server "nodes" that provide up to 64 processors in all.

But users said buying SPs or clusters would cost too much, and that not all applications can be moved to parallel or clustered machines.

"You could just buy another platform, but that's an expensive solution," said Roy Dodd, information systems director at The Good Guys. He suggested that users could break up databases into smaller pieces to run on several networked servers. His site's three 900 series servers already share portions of an Informix Software, Inc. 7.1 inventory database, he said. —Jean S. Bozman

"We will meet the performance expectations of the marketplace. The question is, do I do it with a chip called the 620 or not? There are faster versions of the 604. There are multiple ways to reach a performance point."

— Jeff Mason, vice president of IBM RS/6000 worldwide marketing



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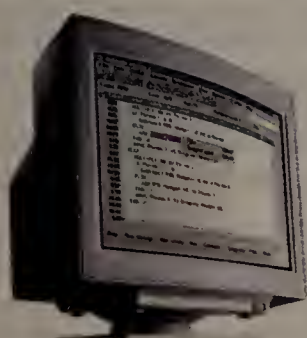
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Bay puts together stackable switch

By Bob Wallace and Laura DiDio

Bay Networks, Inc. is expected this week to announce a stackable 100Base-T and a stackable work-group switch in a two-pronged assault on the high-speed networking market, *Computerworld* has learned.

Bay's new 100Base-T Stackable Hub can be configured to support 12 or 24 100Mbit/sec. ports and can be stacked to support a total of 132 ports, said sources close to Bay who requested anonymity.

"The new hub is positioned to complement rather than replace Bay's existing System 28000 line of high-speed switching hubs," said an analyst who was briefed on the announcement.

The 100Base-T hub comes with

two expansion slots that can be used for additional ports, a fiber uplink module or a network management card. The system is priced at \$2,375, roughly \$199 per port.

The Model 28000 LattisSwitch Ethernet Switching Hubs provide switched Ethernet connectivity at 10M and 100M bit/sec. These stand-alone switches deliver 2G bit/sec. of internal switching capacity.

Bay also intends to announce the BayStack stackable work-group switch, which wasn't designed to replace the vendor's System 3000 hub.

The System 3000 was initially little more than a shared media hub but has evolved to support Ethernet switching.

@Talkback@cw.com

WE ASKED: Is Microsoft coming to the Internet party too late to make a splash? Can it catch up with Netscape? [CW, Oct. 2]

YOU SAID:

With the explosive growth of the Internet, there is plenty of room for Microsoft. I would love to have a browser that integrates with Microsoft Office, [Microsoft's] Visual Basic and all of the hooks in Windows.

Tom Freer
bubba6@ix.netcom.com

I don't think Microsoft is late in this race. I have been using beta versions of Netscape and Internet Browser 2.0 on Windows 95. Microsoft's Internet browser is very colorful in multimedia, and it is more stable than Netscape. I got a couple of hangs with Netscape while I was getting .GIF files. In the past, I noticed that Microsoft comes in with a better way of doing price/performance things that may steal the show. Unix guys have wonderful ideas but complicate the implementation, whereas Microsoft simplifies like WYSIWYG in Word 95 for Internet publishing. I don't know how Unix folks used VI editor for that many years.

Doc Pisapati
Unisys Corp.
Pisapati@pos.bb.unisys.com

If you ask me, Microsoft does not have

the potential to start a name for itself with Internet software. I've been on The Microsoft Network (MSN). The user access is limited both physically and potentially in the sense that Microsoft is new to this field. MSN lets you use any Internet Web browser, such as Netscape or Mosaic. It also has access to third parties who wish to establish themselves on MSN.

Although Microsoft has established a name for itself in other areas of computer software, MSN is a ghetto for the "Internet illiterate."

Jeff Wood
Acerjeff@aol.com

Look back at all the other areas Microsoft has entered. Microsoft starts out with weak products and steadily improves them, marketing them with the skill of a master surgeon, in the process devouring market share. It will be the same with Microsoft's future Internet offerings. No one expects Microsoft "Anything" Version 1.0 to the mark, but given time Microsoft's products always prove themselves as viable alternatives, and if they don't, Bill Gates just buys the alternatives.

Everknown2@aol.com



News Shorts

Mystery glitch hits America Online

Unspecified technical problems at America Online, Inc. cut off an undetermined number of the service's 3.5 million subscribers from their electronic-mail capabilities last Wednesday. A spokeswoman for the Vienna, Va.-based on-line service provider said the problem was felt nationwide. AOL typically processes 4 million messages daily. "This isn't the first time I've had trouble with AOL service, but it hasn't been this severe before," a subscriber in California said.

FCC to regulate frame relay

The Federal Communications Commission has decided to regulate frame-relay service. That means long-distance carriers must file frame-relay tariffs with the FCC. This year, AT&T Corp., Sprint Corp. and MCI Communications Corp. published rates, but they were as firm as sticker prices on a new car. The ruling will mean easy access to frame-relay rates, and carriers will have to stick close to the tariffed rates.



Sun slashes low-end prices

Sun Microsystems Computer Corp. in Mountain View, Calif., cut prices last week on its low-end SPARCstation 4 Unix workstation and added an entry-level model at \$4,295 to compete with PC workstations.

To Russia with IBM

IBM has won what is believed to be the first outsourcing contract of its kind in Russia. Under a five-year deal, IBM will build a data center in Moscow for The National Registry Co., which provides an automated share registration service for privatized Russian companies.

Intergraph goes P6

Intergraph Computer Systems in Huntsville, Ala., has announced new Intel Corp. P6-based workstations for three-dimensional graphics and engineering applications. The workstations will ship in the first quarter of next year.

Free 'net access on Quicken

When San Diego-based Intuit, Inc. ships its Quicken for Windows for 96 personal finance package early next year, users will get free but limited Internet access and a customized version of Netscape Communications Corp.'s Navigator browser, the companies said last week. Intuit has signed a deal with Internet service provider Concentric Research Corp. to shuttle users directly to Intuit's new World Wide Web site at the click of a button.

DataGuide support widens

Five vendors of key data warehousing products announced last week that their products are now integrated with DataGuide, a repository from IBM. DataGuide is LAN-based client/server software designed to serve as an organization's centralized data storehouse. The companies are Pilot Software, Inc. in Cambridge, Mass., Arbor Software, Inc. in Sunnyvale, Calif., Business Objects, Inc. in Cupertino, Calif., Information Advantage, Inc. in Edina, Minn., and Vality Technology, Inc. in Boston.

CNN/ATT unveil pact

CNN Interactive signed an exclusive deal with AT&T last week to provide business news on AT&T's Business Network on-line service, to be launched Nov. 1. AT&T, in turn, will create one-button links from Business Network to CNN's Web site.

Clinton touts technology

President Clinton last week accused Republicans of risking the nation's technological future by seeking to cut federal research programs by a third in order to balance the budget. "We must strengthen, not weaken, our investments in science, technology and research," Clinton said.

Digital rolls out TeamLinks

Digital Equipment Corp. last week announced shipments of Version 2.5 of TeamLinks, a desktop E-mail and file-access application suite for Windows and Macintosh clients connected to OpenVMS and Digital Unix servers. The latest version, which costs \$295 for the full suite, includes a remote access capability via modem or network card.

CICS client goes beta

IBM plans late this month to start beta-testing client versions of its CICS transaction processing monitor with object-oriented interfaces and object class libraries. OS/2 and Windows clients will be supported initially, with general availability due early next year.



IBM releases Ramac 2

IBM this week will announce general availability of its delayed Ramac2 mainframe disk array, which is expected to spur further price reductions in that competitive market. Ramac2 didn't ship in late August as planned because of a potential for buildups of hydrocarbon contaminants in the array's new 4G-byte disk drives.

Eicon ships WAN software

Eicon Technology, Inc. last week became the first internetworking vendor to ship products to enable Microsoft Corp. Windows NT servers to support stand-alone branch office routers. WAN Services for Windows NT, priced at \$595, enables the server to support IP routing over frame-relay, leased and X.25 connections.

Progress offers kit for Visual Basic

Progress Software Corp.'s Crescent division in Bedford, Mass., this week will announce a kit to help developers get up to speed with Microsoft's Visual Basic 4. The VB4 Plus Pak will ship next month for \$49.95.

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January 1995**

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*CIO Magazine 1994 Readers' Choice Awards

Imaging and workflow for all

By Tim Ouellette

This week at Imaging Expo in New York, FileNet Corp. and Wang Laboratories, Inc. will reveal plans to provide users with one-stop shopping for imaging and workflow — from enterprise, high-vol-

ume systems on down to the desktop.

Imaging software transfers paper documents to computer-based image files. Workflow software automates the movement of work items, which are often images themselves, around a company.

FileNet, which bought Watermark

Software, Inc. in Burlington, Mass., this summer, will announce a low-cost client based on Watermark technology for its back-end servers. The Costa Mesa, Calif., company plans to bundle a version of its workflow software with Watermark's imaging server. Watermark plans to enable

both firms' imaging servers to communicate with each other later next year.

Billerica, Mass.-based Wang will preview the integration of Microsoft Corp. Windows NT imaging software from Sigma Imaging Systems, Inc., a firm Wang purchased in June, with Wang's Open/image and Open/workflow products. This move heralds a push into the workgroup space from Wang's previous focus on high-volume, high-end systems (see related story, page 12).

Anticipation

FileNet users said they would look forward to a low-cost, entry-level client.

"We have departments that don't need the full heavy-duty workflow effort" provided by high-cost FileNet systems, said Karen Webster, manager of image technology at the Public Employees' Retirement Association in Denver and president of the FileNet users group UserNet. For the more casual user of imaging and workflow in a company, the Watermark integration will provide an easy way to get at data in a high-level system without a lot of customization, she added.

Bankers Trust Co. in New York welcomes the client software because it had already been trying to get Watermark to work with FileNet's strong back-end servers with the help of an outside consultant, said Laura DelGaudio, technical architect for electronic document management.

To target low-end, low-volume imaging and workflow users, Wang plans to include a free image viewer as a feature of Windows 95 in future upgrades, according to Wang President Don Casey.

& Spalding Sports uses imaging to reduce its product development cycles. See page 57.

Image makers

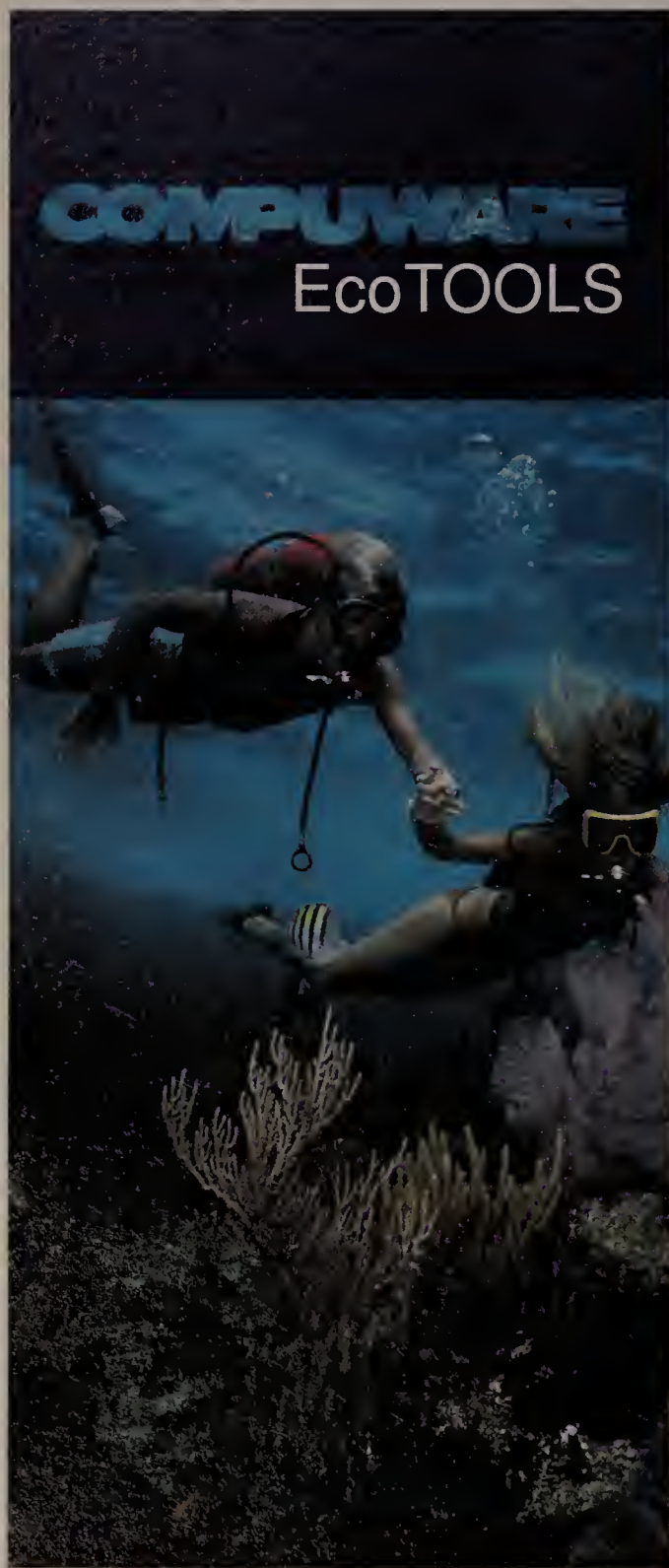
Also at Imaging Expo, Optika Imaging Systems, Inc. will announce a product suite aimed at workgroups.

The low-cost software suites, based on the Colorado Springs company's core set of imaging and storage wares, can then scale up for the enterprise.

"Optika has proven that starting from within works," said Paula Boyle, an analyst at BIS Strategic Decisions in Norwell, Mass. Traditionally, she said, the vendor has gone after the high-volume, highly structured, paper-intensive processes very well while forgoing low-volume, ad hoc installations.

Retailer Eddie Bauer, Inc. in Redmond, Wash., started with an Optika system in accounts payable. That system spread to three other high-volume administrative units, said Kim Afflerbach, manager of financial disbursements.

— Tim Ouellette



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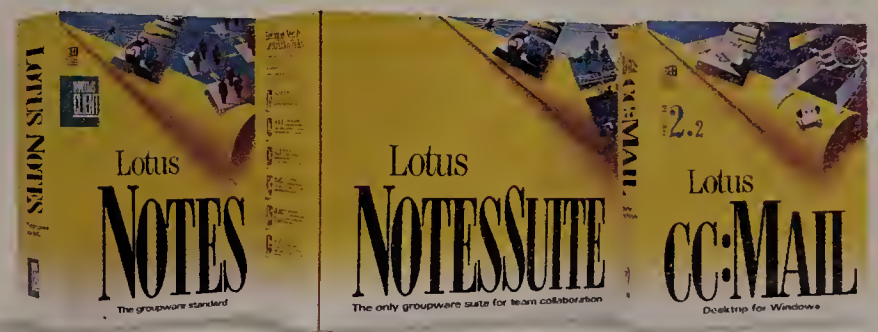
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Compaq still eyes the 'prise

Firm signs up Tandem, DEC to fill enterprise gaps, build server clusters

By Jaikumar Vijayan and Michael Goldberg

Compaq Computer Corp. is teaming with big-iron vendors Tandem Computers, Inc. and Digital Equipment Corp. to help plug some key gaps in its strategy to reach the enterprise computing market.

The moves are expected to strengthen the company's bid for the midrange segment currently owned by minicomputer vendors such as IBM, Hewlett-Packard Co. and Digital. But observers cautioned it will be a while before the Houston company actually gets there.

"Compaq has correctly realized that it is going to take some really high value-add products and services, even if they are from competitors," to succeed in its bid for the midrange market, said Thomas Kucharvy, president of Summit Strategies, Inc. in Boston.

Compaq and Tandem, based in Cupertino, Calif., last week announced they will jointly develop Peripheral Component Interconnect cards and routers based on Tandem's ServerNet architecture to build Microsoft Corp. Windows NT-based clusters of Compaq servers.

Compaq's CEO Eckard Pfeiffer described the moves as an effort to pull together "the key elements needed to make the distributed enterprise work" and to provide users with a "supplier who can pull all the best-of-breed pieces together and orchestrate the entire solution."

base applications, analysts said (see chart).

Compaq hopes to use such Windows NT-based server clusters, or arrays, to compete with its traditional minicomputer rivals. Compaq's first four-node cluster based on Intel Corp.'s P6 chip is due late next year.

Meanwhile, Compaq's partnership with Digital is expected to provide sorely needed enterprise-level service and support capabilities. Digital will provide global support for all Compaq products.

Some users at last week's Compaq-organized Innovate Forum '95 in Houston applauded the company's latest moves. "I think they are positioning themselves as a real player in the distributed computing marketplace of the future by covering all their bases," said Harry Sunenshine, vice president of information at Kraft Canada, Inc. in Don Mills, Ontario.


The kind of capabilities and the technologies Compaq is adding are "certainly where the fu-

ture is headed," said Thad Mauldin, executive director of the U.S. Space and Rocket Center in Huntsville, Ala.

ture is headed," said Thad Mauldin, executive director of the U.S. Space and Rocket Center in Huntsville, Ala.

But Compaq still must close some vital gaps for its enterprise strategy to succeed, analysts said. By far, the most important need is software to hold together the disparate hardware elements of a clustered server architecture. The Tandem alliance will provide the physical connectivity, but Compaq still will have to wait for the operating system and application software components to fall into place.

Compaq and Tandem already are working with Microsoft to help design a clustering application programming interface (API) for Microsoft's Windows NT and BackOffice. Such an API won't be available to application developers until well into next year, however.

 **Hewlett-Packard** is launching a program to buy back any brand of PCs. See page 50.

Compaq's clustering route

Standby Recovery Server for Windows NT and NetWare	Q2 1995
On-Line Recovery Server for Windows NT	Q2 1995
Oracle support for On-Line Recovery Server	Q4 1995
Microsoft SQL transparent client reconnect for On-Line Recovery Server	Next release of Microsoft SQL Server
Oracle7 automatic reconnect for On-Line Recovery Server	First half 1996
Tandem ServerNet interconnect for scalable Windows NT Server database clusters	Q4 1996/Q1 1997

Wang users cheer VS developments

Product upgrades sustain user base

By Neal Weinberg
BEDFORD, MASS.

The Wang Laboratories, Inc. user group may be dead, but its members are still kicking.

Last week, Wang's VS users said they felt like they won a new lease on life when the company announced new products and upgrades to the proprietary minicomputer line.

At a company-sponsored show called InterAction, Wang said it was building a CMOS chip for a high-end VS 16000 box that will be available late next year. Wang also announced new tape and disk drives and connectivity software.

Users who stood by the company through its 1992 bankruptcy filings said they were relieved that Wang seemed to be back on its feet financially and continuing to support its VS base. Many were moving applications off the VS system but wanted to migrate on their own terms.

Don Travis, information systems supervisor at Churchill County Telephone Systems in Fallon, Nev., said that even though he doesn't plan to buy a 16000, he is pleased that Wang is developing it.

"As long as new equipment is coming

out, Wang is still viable," he said.

ITT Hartford, a major VS site with more than 60 machines, will likely move up to the 16000s when they come out, said Alex Kuhn, a systems analyst at the Hartford, Conn.-based insurance company. "It's nice to see they're still supporting VS," Kuhn added.

Most users were looking down the road toward either a complete migration off VS or a coexistence strategy in which some applications are moved off VS while others remain.

Staving off the inevitable

The development of the 16000 means "migration for existing production applications, while probable in the very long term, can be postponed because the price/performance of the new VS environment is adequate to meet the requirements of the CFO," said Tom Willmott, an analyst at Aberdeen Group, Inc. in Boston.

"I think they're doing a great job harvesting that VS base and maintaining a high level of customer satisfaction," Willmott added.

Quill Co. plans to use a Wang VS and a Novell, Inc. LAN for the next three years and then migrate completely off the VS, said Manuel Silva, data processing manager at the Cranston, R.I.-based pen company.

Silva said he appreciates Wang's offering users help in formulating their migration strategies rather than fighting the tide of defections to open systems. The company's Customer Services Business offers network integration consulting services for VS customers. In addition, Wang continues to develop software for connecting VS systems to PC LANs.

Why Wang?

Users gave the following reasons when asked why they are staying with Wang technology:

"There's no reason to change. The stuff runs; it's happy."

— Christopher Izzo, technical operations analyst, Healthcare Underwriters Mutual Insurance Co., Latham, N.Y.

"Nothing else made sense."
— Coral C. Clarke, systems analyst, Baptist Life, Buffalo, N.Y., who decided after looking at conversion costs to stick with VS and upgrade the system

"We'll keep it until we're compelled to leave."
— Don Travis, IS supervisor, Churchill County Telephone Systems, Fallon, Nev.

"We still run a 7000, and we'll probably run it forever," said Christopher Izzo, technical operations analyst at Healthcare Underwriters Mutual Insurance Co. in Latham, N.Y. But rather than buying any new VS models, Izzo said his game plan is to wean applications off the VS.

After investigating alternatives to the VS, Coral C. Clarke, a systems analyst at Baptist Life, an insurance company in Buffalo, N.Y., decided to upgrade rather than migrate. "We haven't seen anything else that will do what we need," she explained.

Eventually, she said she plans to combine the VS system with a PC-based LAN, but the Wang box will be around "for the foreseeable future."

The Wang users who attended InterAction didn't seem bothered by the fact that the event was company-sponsored, not user-sponsored. The International Society of Wang Users went out of business over the summer because of declining membership.

Wang's VS 16000

FUNCTIONS: Data processing, application server
PRODUCT DELIVERY: Late 1996
MICROPROCESSOR: CP-16; .5-micron chip design
CACHE: Two-level
CHIP BETA TEST: First-quarter 1996
CHIP DELIVERY: Second-quarter 1996
PRICE: Not available



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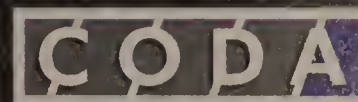
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In 'net we trust

Users deposit faith in first on-line-only bank

By Thomas Hoffman and Kim S. Nash

Security First Network Bank, FSB (SFNB) could become the Microsoft Corp. of the virtual banking community.

That is what analysts and users were saying last week after SFNB became the nation's first Internet-based bank to open its cyberdoors for business. SFNB, an Atlanta-based subsidiary of Cardinal Bancshares, Inc., began offering customers the ability to write electronic checks, make deposits and pay monthly bills on-line (<http://www.sfnb.com>).

Eric Walter, a 27-year-old customer support specialist at MCI Communications Corp. in Atlanta, was the first customer to toggle through SFNB's virtual pillars at 12:01 a.m. last Wednesday. "I was champing at the bit," said Walter, who intends to use the service at home and at work using his IBM 755CD laptop.

Like many skeptics, Walter had some

butterflies about transferring his funds over the Internet. "But after studying what SFNB did with their cryptography and firewalls, I felt comfortable," said Walter, who is considering transferring all of his bank accounts from Wachovia Corp. to SFNB.

Wachovia and Huntington Bancshares have invested in SFNB and plan to license the same Five Paces, Inc. Virtual Bank Manager software that SFNB uses.

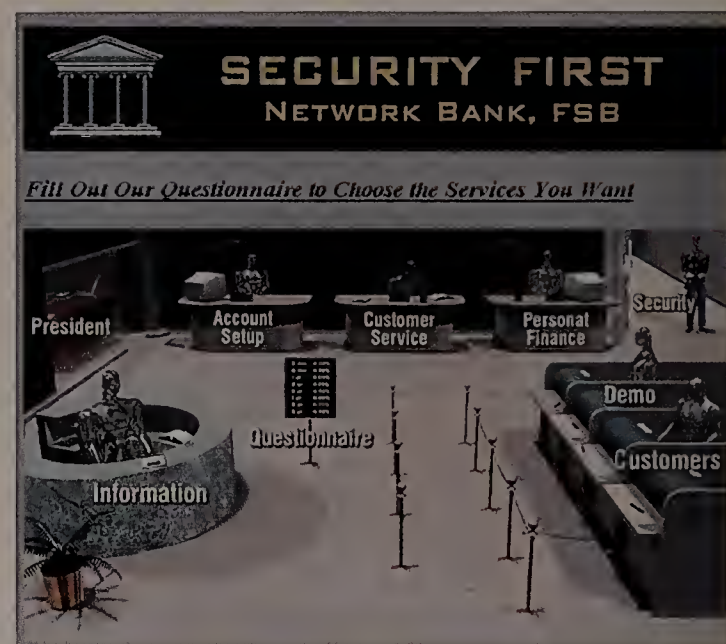
Five Paces tapped SecureWare, Inc. and Hewlett-Packard Co. to develop a multilayered security system that uses the same technology Atlanta-based SecureWare developed for the U.S. military and intelligence agencies.

SFNB's Atlanta data center will handle customer traffic using three HP 9000 servers running HP-UX and its HP-UX Trusted Operating System. SFNB will route customer transactions over 56K bit/sec. lines to M & I Data Services in Mil-

waukee, which in turn will process deposits, checks and wire transfers using its Integrated Banking System.

"I think larger banks approach paralysis when it comes to developing a secure means of conducting electronic commerce," said Michael Brown, a vice president at The Dover Group, Inc., an Atlanta banking and financial services consultancy. SFNB "has taken the risk out of on-line banking with their security architecture," Brown said.

While some 215 banks have set up some form of Internet access or World Wide Web pages, SFNB stands alone in providing full-service on-line banking. BankAmerica Corp., for example, upgraded its Web site last week to include



On the SFNB home page, users can write electronic checks, make deposits and pay monthly bills on-line

on-line credit-card and loan applications. But BankAmerica said it doesn't offer full-fledged on-line transactions.

& A tool from an Australian firm helps companies get up on the Web. See page 90.

Spider spins out tool kit to improve database/Web link

By Kim S. Nash

Spider Technologies, Inc. today begins shipping a World Wide Web development tool kit designed to address the growing problem of connecting on-line applications to information stored on legacy corporate databases.

But 5-month-old Spider isn't the only company rushing to fill the dead air that often exists where a database/Web link should be.

Oracle Corp., Next Computer, Inc. and a host

of other companies have announced or started shipping such products (see chart).

The lack of such utilities hasn't stopped some users from building programs for on-line use, but many are eager for automation. Until now, programmers at these firms have had to manually code the connective tissue required.

Looking ahead

Lockheed Information Technology Co., for example, wants to put internal telephone directories on-line, using an Oracle or Sybase, Inc. database on the back end and a Netscape Communications Corp. browser on the front end.

"We're hoping to see a lot of this integrated in browsers, servers and other products in the future but no such luck so far," said Art McAnarney, a senior programmer analyst at the aerospace company in Denver.

Spider hopes to take advantage of that need with Spider 1.1, a tool set designed not only to help users build programs to run on Web servers but also to access information in databases from Informix Software, Inc., Oracle and Sybase.

Informix, Oracle and Sybase have teamed up with Spider to support Spider 1.1, but the Big 3 database makers each plan to release their own Web/database middleware sometime next year.

Spider Chief Executive Officer Zack Rinat said he feels the heat, "but we are there [with products shipping] right now. They're not."

A free beta-test version of the product has been available from Spider's Web site since August (<http://www.w3spider.com>).

On-line expo covers gamut

By Kim S. Nash

Like the 'net itself, next week's Internet World conference in Boston is expected to vibrate with chaos. New product announcements touching virtually every aspect of building, managing and milking on-line applications are expected.

IBM will be a headliner with a handful of announcements including plans to unveil a hardware/software World Wide Web server bundle that runs on the OS/2 Warp operating system, an IBM insider said.

Also expected are details about how AS/400 minicomputers can be used as Internet servers.

Elsewhere in the Web server sector, Mountain View, Calif.-based Connect, Inc. is expected to announce an electronic commerce product to round out its line of servers. The Wollongong Group, Inc. in Palo Alto, Calif., plans to announce an upgrade to its Emissary server and tool kit.

Attendees at the show, which is sponsored by Westport, Conn.-based Mecklermedia Corp., will be able to see an early version of FTP Software, Inc.'s Keyview utility. Similar to Adobe Systems, Inc.'s Acrobat, the product lets users view documents of file formats without running the application in which the files were created.

For novice Web developers, Adobe has planned a pair of two-hour how-to sessions to teach the basics of building on-line applications. Participants will come away with the beginnings of their own home pages, a spokeswoman said.

Curious about the who, how and why of Internet usage? CommerceNet, a Menlo Park, Calif.-based consortium of 140 vendor and user

companies pushing the idea of electronic commerce, plans to reveal the results of a three-month survey of Internet users and applications.

Other key announcements include the following:

- Software.com in Santa Barbara, Calif., will unveil Post.office. The \$500 product supports Simple Mail Transfer Protocol and Post Office Protocol. The package, which runs on Microsoft Corp.'s Windows NT and Sun Microsystems, Inc.'s SunOS and Solaris, costs \$500 per server, with no per-user fees.

- *Yahoo Unplugged*, a book of tips and tricks for using the popular Yahoo Web search site, will be unveiled by IDG Books, a unit of Framingham, Mass.-based International Data Group.

- An auditing product for monitoring internal and external corporate Web sites is expected from Internet Profiles Corp. in San Francisco.

Surfing the database

The following vendors have promised to provide some form of translation between the World Wide Web and SQL, or the Structured Query Language, used by relational databases:

VENDOR	PRODUCT	AVAILABILITY
Bluestone Mt. Laurel, N.J.	SapphireWeb	Shipping
Edify Santa Clara, Calif.	Electronic Workforce	Shipping
Navisoft Vienna, Va.	NaviServer	Shipping
Next Redwood City, Calif.	WebObjects	First quarter next year
Oracle Redwood Shores, Calif.	Yet to be named	Early next year

of other companies have announced or started shipping such products (see chart).

"People are waking up to the fact that this kind of communication is absolutely critical" for internal and external Web sites, said Greg Cline, an analyst at Business Research Group in Newton, Mass.

The most urgent need for database/Web links is among users building applications for inter-

Notebook vendors target the high end

Toshiba, HP and NEC to introduce expensive, multimedia Pentium portables

By Mindy Blodgett

Users of premium multimedia notebooks now have more to choose from thanks to new products on the way from three leading portable makers: Toshiba America Information Systems, Inc., Hewlett-Packard Co. and NEC Technologies, Inc.

The snazzy offerings, all built around Intel Corp.'s recently announced 120-MHz Pentium processor, join an increasingly crowded field, according to industry observers.

The feature-rich notebooks are aimed at replacing desktops. They cost from \$5,000 to just under \$7,000, which puts them out of the reach of most users.

"These machines are fabulous pieces of engineering," said Mike McGuire, an analyst at Dataquest, Inc. in San Jose, Calif. "The bottom line is that we would all love to have a Ferrari, but most of us have a Mazda in the driveway."

More options

The slate of new notebook announcements includes the following:

- This week, HP will announce the HP OmniBook 5000 CTS 5/120 PC and a docking system for its entire range of OmniBooks, including notebooks with 75- and 90-MHz chips. HP also has incorporated lower-priced portables into the line. The

OmniBook 5000 CTS 5/120 is based on the Peripheral Component Interconnect bus and offers accelerated graphics and performance, a 10.4-in. screen and a price tag of \$6,630. The OmniBooks

will ship in early December.

- Also this week, NEC will announce the Versa 4080 notebook, also powered by the 120-MHz Pentium. The machine, which will ship later this month, will feature a slot that gives users the option of adding a CD-ROM drive, a second battery or a second hard drive. It also offers a recessed keyboard, palm rest and touch-pad pointing device. It will cost \$5,499.

- Toshiba last week announced its long-awaited high-end offering, the 700 Series, which comes in two models, the 700CS and the 700CT. Both are equipped with the 120-MHz Pentium chip. The series offers an 11.3-in. thin film transistor active-matrix screen, removable hard drive and a docking station. Pricing wasn't available, but the notebooks will ship early next month.

The plethora of multimedia notebooks offers real advances in notebook technology, industry analysts said.

But Andrew Seybold, editor of "Out-

look on Communications and Computers," said the recent focus on high-end notebooks is leaving mobile users merely seeking fast connections to the

office out in the cold.

"These are desktop replacements, not true portables," Seybold said. "There is a whole group of people out there who

just want information access and communications, not multimedia for presentations." But McGuire said the advanced technology used to create the notebooks will trickle down to the value end of the market. "These advances will benefit all portable users eventually," he said.

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Interoperability pact between CDPD carriers eases access

By Mindy Blodgett

The ease and availability of wireless access took another step forward last week with announcements from GTE Mobile-net, Inc. and Bell Atlantic Nynex Mobile.

The two Cellular Digital Packet Data (CDPD) carriers are offering customers access to each other's networks thanks to an interoperability agreement. CDPD is a mode of transmitting data over a wireless network via the Internet Protocol.

Starting immediately, a GTE customer in the carrier's Houston market, for instance, can access Bell Atlantic's networks in Connecticut and vice versa.

This will make roaming—or "visiting," in carrier parlance—much easier.

Service availability

Initially, the service will be available to customers in Bell Atlantic's Connecticut system and to GTE customers in all markets. However, the agree-

ment covers future markets for both carriers as well.

Each network will set its own rates, but users will receive a single bill from the user's home carrier.

Seeing the future

Such interoperability agreements are vital to the future of wireless and CDPD, industry observers said.

"One of the shortcomings of CDPD currently is the lack of interoperability," said Robert Hirsh, director of wireless data at Bell Atlantic Nynex Mobile in Bridgewater, N.J. "Providing that is a way of providing a nationwide network."

The most recent interoperability compact is the second for Atlanta-based GTE, which reached a similar agreement with Ameritech Cellular Services in July. The GTE/Ameritech agreement was the first in the industry.

Further interoperability agreements are on the horizon, CDPD carriers say. "There will absolutely be more such agree-

ments," Hirsh said.

In other wireless news, AT&T Wireless Services' Wireless Data Division in Kirkland, Wash., formerly McCaw Cellular Communications, Inc., announced last week that it is offering circuit-switched cellular service in New York and New Jersey. Circuit-switched cellular is a technology enabling users to send data over cellular links using a cellular modem.

Simultaneously, AT&T announced CDPD service in New York City. Bell Atlantic Mobile also offers coverage there.

How it works

Both CDPD and circuit-switched cellular use the cellular network to send data over cellular links. But circuit-switched data uses a dedicated wireless connection. CDPD, on the other hand, adds packet data capabilities to cellular networks and doesn't require a dedicated line.

Short, bursty file transactions are better for CDPD; longer file transfers are suited to circuit-switched cellular.

Bell Atlantic and GTE offer circuit-switched cellular in their markets as well.

MCI services enable remote user dial-in to frame-relay networks

By Neal Weinberg

MCI Communications Corp. last week introduced a broad set of services that allow telecommuters and traveling salespeople to dial in to their company's corporate frame-relay network from laptop computers.

Remote access to frame relay isn't new, but MCI offers the most comprehensive suite of analog and digital options in the industry, said Christine Heckart, an analyst at TeleChoice, Inc. in Verona, N.J.

Benefits abound

The service would be a major benefit to companies with telecommuters, said Jim Garlans, manager of network services at United Technologies Corp. in Hartford, Conn.

Garlans also said the ability to establish an Integrated Services Digital Network (ISDN) link to the frame-relay network provides an additional benefit because ISDN has the flexibility to carry voice, video and data. MCI said it will offer that capability in mid-1996.

Heckart said that in addition

to individual users, the MCI service would be suited for small branch offices that can't justify the cost of a dedicated frame-relay connection yet need more than simple modem access to the network.

John Dex, product marketing manager for data access services at MCI, said the company's goal is to give remote users access to the same applications as people

at corporate headquarters. Heckart said remote access to frame relay represents "a huge market opportunity," especially at companies with large mobile sales forces.

In addition to giving remote workers greater access to applications, the dial-in option saves money because users can get onto the network through a local call instead of having to dial long-distance, Heckart said.

As part of the service, MCI offers connections to Telnet servers over an 800 line. It also provides a connection between X.25 and frame relay for multinational companies with X.25 networks in countries where frame relay isn't available.

Telecommuting

3Com

CONTINUED FROM COVER 1

pose switching hub angered some users that have invested in 3Com switching products.

"This is a very unfortunate and illogical decision," said Steve Lopez, a network manager at the National Board of Medical Examiners in Philadelphia, a longtime 3Com customer. "Chipcom products can't hold a candle to 3Com's switching systems. 3Com's technology is far superior."

Lopez has roughly \$250,000 invested in six 3Com LANplex 6000 switches. "We want [3Com] to focus on enhancing and evolving these switching hubs," he said.

John Boyle, 3Com's vice president of business development, stressed that the company will continue to enhance, service and support its LANplex and Cellplex switches for at least five years. He added that users looking for breadth in

switching should move to Oncore.

And although 3Com plans to offer users of Chipcom's popular Galactica switching system incentives to migrate to Oncore, some users won't budge. Galactica will be sold, serviced and supported but gradually phased out, 3Com said.

"We've got multiple Galacticas and love them to the point that we'd buy new ones up until the very last day they're sold," said one network manager who requested anonymity. "The technology is outstanding, so we have no plans to move to other switching hubs."

Analysts said users should turn up the heat on 3Com to make good on promised enhancements to products that are being phased out and press the vendor to provide other features to maximize their current investment.

"Users need to do themselves a favor and, instead of panicking, let 3Com know what they want and what they need," said Mary Petrovsky, a senior analyst at The Burton Group, a consulting firm in Salt Lake City. "It's not 3Com's plan to leave anyone high and dry."

3Com also detailed its network management plans for Unix platforms in the second half of next year (see chart).

This is a key area because many Chipcom switching hub users have several pieces of 3Com inter-networking equipment.

"I'd really like to see 3Com working on integrating the two packages for use on a Windows platform," said Steve Flis, network manager at MetroWest Medical Center in Framingham, Mass. "Using different icons for each package on a common workstation is OK, but the real benefit would be integrating things like alarm notification as soon as possible."

Boyle said providing management wares on PC platforms is part of 3Com's plan, but he wouldn't say when users could expect them.

Chipcom users questioned 3Com's distribution strategy, which calls for 3Com to sell its products through Chipcom's

3Com's new network management strategy

PHASE 1 (December 1995)

3Com will ship its Transcend Enterprise Manager with Chipcom's Ondemand Network Control System for use on a common Unix workstation. The systems can be run concurrently as separate icons (similar to Excel and Word on the same platform).

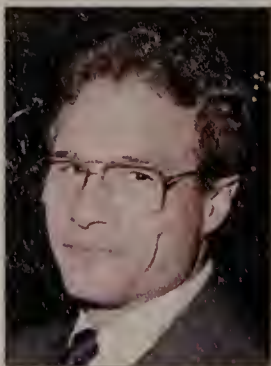
PHASE 2 (March 1996)

3Com's objective is to provide management for devices with basic commonality such as the two companies' virtual LAN schemes.

PHASE 3 (second-half 1996)

Full integration of the two packages

Source: 3Com Corp., Santa Clara, Calif.



Steve Flis: 'Not every user can afford to buy Unix workstations' for 3Com's integrated network management system

partners. But 3Com will not sell Chipcom products through its own distribution channels.

"There could be channel conflict as a result because in some cases, there are many distributors that already sell 3Com gear," said Alan Robson, director of information services at Val-Pak Direct Marketing Systems, Inc. in Largo, Fla.

Boyle said 3Com's goal "is to minimize channel pain."

The largest ATM trial currently under way to go live in February. See page 67.

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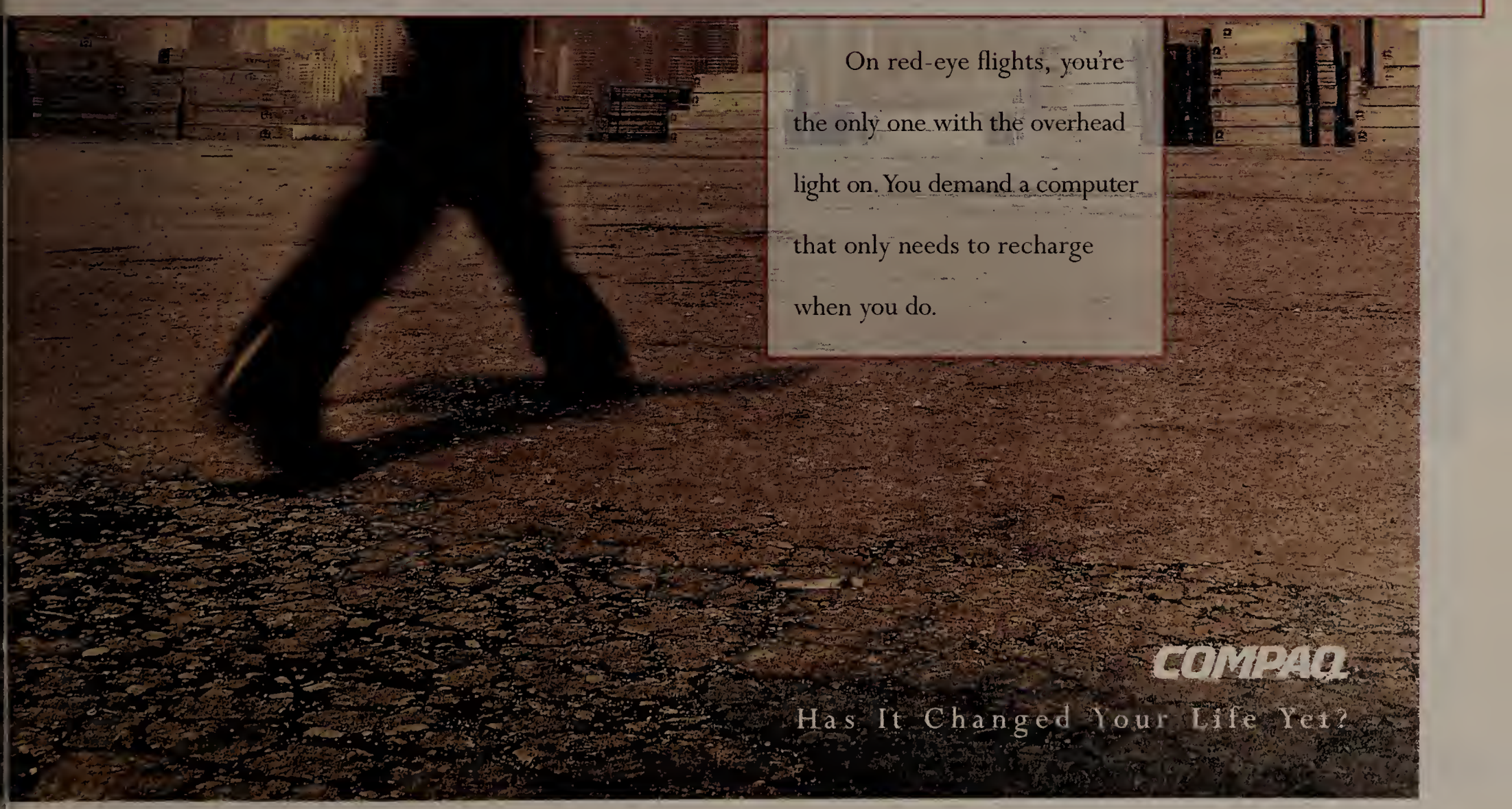
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Has It Changed Your Life Yet?

Spectrum gears up for management test

By Patrick Dryden

After months of preliminary testing with key users, Cabletron Systems, Inc. froze the code last week for Version 4.0 of Spectrum enterprise network management software, stopping the clock on all fea-

tures and enhancements in order to ship the version early next year.

Beta testing will start next week, and the new version should ship on Microsoft Corp.'s Windows NT and multiple Unix platforms in the first quarter of next year, as expected [CW, Sept. 4].

Many administrators are eager for a version that can run on a PC platform and without Unix expertise. They want to see for themselves, however, if Spectrum on Windows NT really can handle the monitoring and database demands of their networks.

"With the NT option we can match the right tool to the right location, cutting our overall support costs, because [NT systems] tend to be easier to manage than Unix systems," said John Bullivant, vice president of corporate technology at J.P. Morgan & Co., the New York-based financial giant. "But it's too early to gauge this version's price-performance," he said.

"Intel-based PCs certainly are cheaper than the IBM RS/6000 workstations we run Spectrum on now, but I don't know yet if an NT system is powerful enough to monitor the 2,200 devices on our network," said Kevin Blackburn. He is a senior telecommunications specialist at Time Customer Services, the division of Time Warner, Inc. publishing that handles logistics for magazines and company networks.

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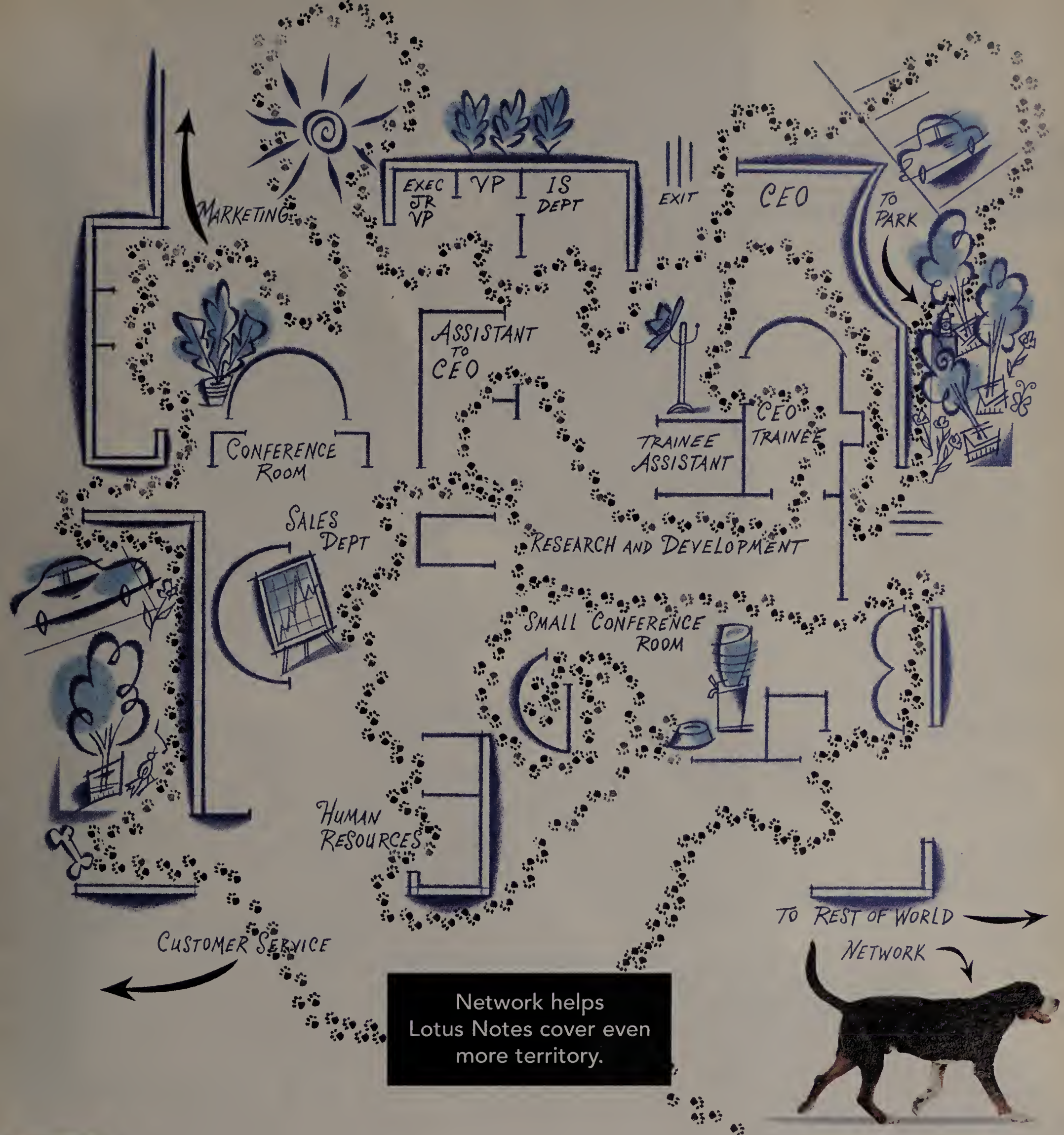
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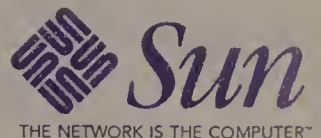
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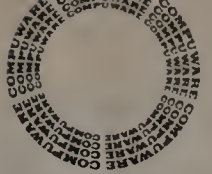


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A few unprovoked remarks about UNIFACE application-building strongware from Reggy "Chainsaw" Morgan, social secretary of Client/Server Angels International, West Covina Chapter.





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UNIFACE APPLICATION DEVELOPMENT STRONGWARE

Piecemeal outsourcing on the rise

By Craig Stedman
ORLANDO, FLA.

Selective outsourcing is getting even more selective.

Companies are increasingly seeking outside help as they struggle to cope with

the new math of client/server. As part of that trend, the concept of selectively outsourcing pieces of the data-processing equation has emerged in the last few years as an alternative to handing over everything to outsourcers. But now, information systems executives in many

cases are looking at outsourcing just pieces of the pieces, according to users and analysts at Gartner Group, Inc.'s Symposium conference here this month.

This approach, labeled "out-tasking" by one Gartner Group analyst, lets IS organizations retain control over key func-

tions such as application development and help desks. But the organizations can then use outsourcing vendors to augment internal skills or off-load repetitive tasks such as PC upgrades.

Duane Levandowski, manager of programming and development at Sanofi Diagnostics Pasteur, Inc. in Chaska, Minn., said the maker of medical testing products may outsource the process of upgrading, changing and moving PCs to free up its help desk.

"Because the help desk is getting buried in some of the menial tasks, we aren't able to give users the kind of service we want to," Levandowski said. As a result, the company's quality of service is rated as "good but declining," he added. Sanofi also is considering moving all of its processing to Unix systems, and such a move could create a need for outsourcing help in application development, Levandowski said.

Help wanted

Gartner Group analysts made the following projections about outsourcing trends at the recent Symposium conference:

- 75%** of companies will selectively outsource end-user computing tasks within three years
- 70%** of outsourcing customers will demand value-added services, rather than cost-savings, by 1997
- 20%** of outsourcing deals will involve application development or maintenance by 2000
- 40%** or more of all help desks will use outsourcing vendors within three years
- 90%** of the help desk deals will be to assist internal workers rather than replace them

Source: Gartner Group, Inc., Stamford, Conn.



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Computer Industry

Financial results for third-quarter 1995

COMPANY	REVENUE JULY THROUGH SEPTEMBER	PERCENT CHANGE FROM 1994	PROFIT/LOSS JULY THROUGH SEPTEMBER	PERCENT CHANGE FROM 1994
Apple Computer, Inc.	\$3B	20%	\$60M	-48%
AT&T Corp. ¹	\$19.7B	5%	\$262M	-75%
Compaq Computer Corp.	\$3.6B	28%	\$245M	22%
Computer Associates International, Inc. ²	\$812M	30%	-\$637M	NM
IBM ³	\$16.8B	9%	-\$538M	NM
Informix Corp.	\$180M	54%	\$25.3M	52%
Intel Corp.	\$4.17B	46%	\$931M	41%
Microsoft Corp.	\$2.02B	62%	\$499M	58%
Sun Microsystems, Inc.	\$1.49B	17%	\$84.7M	121%
Sybase, Inc.	\$233M	27%	\$1.1M	-94%

NM = Not meaningful

¹ Includes one-time restructuring charge

² Includes one-time charge for Legent

³ Includes one-time charge for Lotus

Big hitters post big gains with third-quarter results

By Computerworld staff

Computer industry bellwethers reported strong gains in the third quarter, though the biggest one of all, IBM, took a larger-than-expected hit for its purchase of Lotus Development Corp. this summer.

Even so, investors responded by driving stock prices up across the technology sector.

Wall Street had previously responded to this summer's strong results by dumping technology stocks [CW, July 24]. This was, in part, due to attempts by IBM and Microsoft Corp. to downplay their future earnings.

There was no need for Microsoft to worry, though. The Redmond, Wash., company reported that sales for the third quarter, traditionally its slowest of the year, turned out to be its best quarterly results ever. Revenue was fueled by much-higher-than-expected sales of Windows 95 and Office 95.

Lotus drags IBM down

On the other hand, after a string of bang-up quarters, IBM lost some steam as hardware revenue flattened because of various product delays and component shortages. A \$1.9 billion charge to cover its summer acquisition of Lotus produced a net loss for IBM.

However, its third-quarter operating profit, before the charge, doubled last year's figure and fell just shy of Wall Street forecasts.

Delays in IBM's AS/400 development also caused software sales to come in lower than expected, said Gary Helmig, a financial analyst at Soundview Financial Group in Stamford, Conn. And the IBM PC Co. reverted to single-digit revenue growth to drag down the company's hardware gross margins, thanks to sluggish sales growth in Europe and the U.S. coupled with price cuts in its portables line.

"This was a step backward" for the PC Co., Helmig said.

Richard Thoman, IBM's new chief financial officer, confirmed expectations that additional layoffs are

planned for the current fourth quarter. Thoman didn't say how many of IBM's 225,000 employees will get the ax, but analysts said they expect the company to chop 5,000 to 10,000 people.

Despite posting its best sales figures ever, IBM partner Apple Computer, Inc. fell prey to component shortages and order backlogs, which in Apple's case hovered about \$1 billion. The Cupertino, Calif., company was also hurt by dependence on sales of low-margin Macintoshes, which resulted in a lower profit than last year, analysts said.

AT&T Corp. also suffered reduced profits after taking a charge to restructure its computer manufacturing operation. The charge will pay for the elimination of 7,200 jobs and 1,300 contractors.

Meanwhile, exactly 10 years after the introduction of its first 80386 chip, Santa Clara, Calif.-based Intel Corp. continues to have record quarter after record quarter, fueled by accelerating acceptance of the Pentium processor among both home and corporate buyers.

Among PC makers, Compaq Computer Corp.'s sales boomed again, and inventory increased to \$2.3 billion from just over \$2 billion last year. According to company officials, this is just a buildup for the fourth quarter, traditionally the busiest selling season of the year.

Internet use and growing user interest in networked servers helped boost sales and more than double profit for Sun Microsystems, Inc., company officials said. Sun Chief Financial Officer Michael Lehman also said Sun sold more high-margin multiprocessor servers in the quarter.

Thanks to increased sales of its midrange software, including CA-Unicenter, Computer Associates International, Inc. also exceeded analysts' earnings forecasts. Though the Islandia, N.Y.-based company's operating profit increased 31% from the same period last year, CA — much like IBM — took an \$808 million after-tax charge associated with its recently completed acquisition of Legent Corp. That resulted in a loss.

AT&T seeks to divest itself of Paradyne

Sale of profitable unit puzzles users

By Bob Wallace

AT&T Paradyne Corp., the vaunted data networking equipment arm of AT&T Corp., last week became the first casualty of the communications giant's recent breakup when the parent company announced plans to sell the Largo, Fla.-based firm.

"By separating Paradyne from AT&T's other equipment businesses, Paradyne avoids possible conflicts in selling to AT&T's competitors," an AT&T spokesman said.

AT&T wouldn't say if it has a buyer for Paradyne, which has roughly 1,300 employees and had an approximate revenue of \$300 million last year. Analysts say they haven't heard of any potential suitors.

An AT&T Paradyne spokesman claimed that Paradyne, which AT&T acquired in 1989, has been profitable since 1990. But he wouldn't say if the company would turn a profit this year.

Analysts said the company has been badly mismanaged, though AT&T denied that.

What happened?

"They had everything going for them," said Maribel Howard, a research analyst at International Data Corp. in Framingham, Mass. "They had a solid revenue base, the AT&T name behind them, and they were innovators with high-quality products. Their management team screwed up big time."

Users were left scratching their heads.

"Their products work great, and their technologies are innovative," said a network manager at one Florida-based firm who requested anonymity. "I'm baffled by this." He agreed that the company wasn't managed well.

The spokesman said a sale "would put Paradyne in the best position to explore relationships with existing customers and explore new opportunities with its leading-edge technologies" but wouldn't elaborate.

Paradyne pioneered two key technologies that work over regular telephone lines: VoiceSpan, which supports simultaneous voice and data transfer, and GlobeSpan, which lets telephone companies deliver T1 data links cheaply.

The company also makes high-speed modems and equipment that enables users to connect to wide-area data links. Paradyne recently left the low-end modem market.

In September, AT&T broke itself into three units: a long-distance services group, AT&T Global Information Solutions and an equipment group that covers phones, telephone companies switches and transmission equipment and microelectronics products.

At least two analysts predicted a bleak future for Paradyne.

"We'll see vendors descend on the company like vultures and pick away at it," predicted Daniel Briere, president of TeleChoice, Inc., a Verona, N.J.-based consultancy. "It's going to get bloody, and the carcass that remains will be Paradyne employees."

"They never made the link with their network services unit work, which is a real shame."

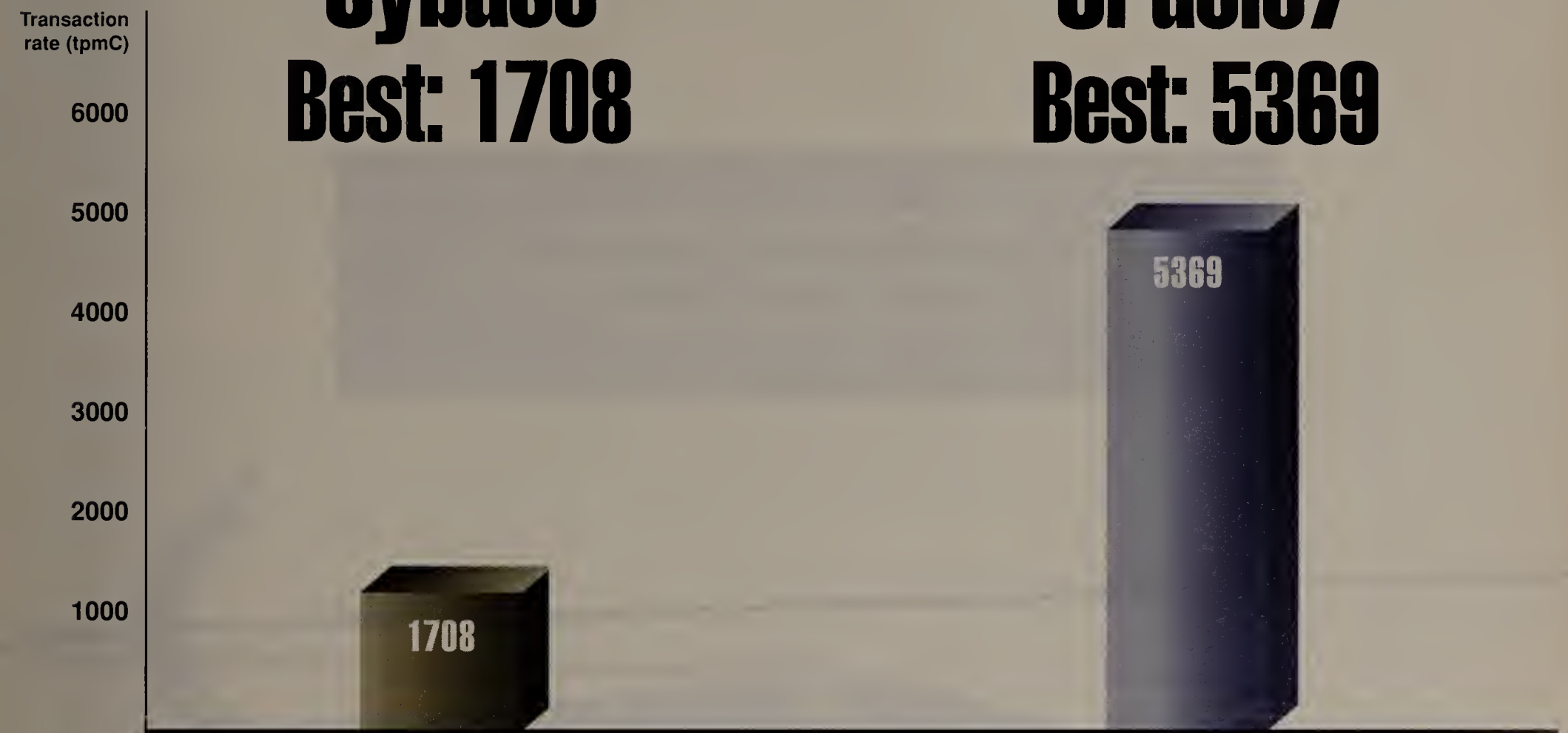
— Daniel Briere, president, TeleChoice, Inc.

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Mark Hoffman, Sybase CEO, *The Wall Street Journal*, April 14, 1995

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Mark Hoffman, Sybase CEO, *San Francisco Chronicle*, April 5, 1995

Experts and customers recognize that Sybase's problems will take a long time to fix. So should you.

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Salomon Brothers, *Computerworld*, April 17, 1995

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First Albany, *Information Week*, April 17, 1995

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CONTINUED FROM COVER 1

ter at National Public Radio in Washington. With a bachelor's degree in audio engineering and English, Holt is a self-taught Unix aficionado who says a webmaster's most important skill is "the ability to combine left- and right-brained thinking." He's 25.

One thing is certain: webmasters are from all walks of corporate life and they are treading on IS turf. Kendra Thrasher, webmaster at Upjohn Co.'s Greenstone Healthcare Solutions division, is a 50-something registered nurse. She volunteers as a webmaster on her own time.

"I have a friend who works for the company that helped design the site. They needed someone to take care of it, so here I am," Thrasher explained.

She likes teaching friends and colleagues about on-line life. "A lot of people here are only just starting to get on the Internet. We're pretty rural," she said, referring to her hometown of Coldwater, Mich., and its population of 15,000.

Sidestepping IS

Con-Way Transportation Services' webmaster is 41-year-old Gary Frantz, who is also the Menlo Park,

Calif.-based shipping company's director of corporate communications. Con-Way skirted IS altogether when its marketing department decided to launch a site.

"We knew our MIS people had some capability," Frantz said. "But we were more comfortable going with people who had some experience in this."

Yet who assumes a webmaster position depends on what a company wants to do with its Web site, experts said.

For users whose Web pages are basically static brochures that salespeople would otherwise hand out, a webmaster without technical skills is OK, said Joe Baltimore, a senior network engineer for information services at Cracker Barrel Old Country Store, Inc. in Lebanon, Tenn. But companies looking to conduct business or create complicated interactive locales on-line must involve IS, said Geoffrey Bock, an analyst at Patricia Seybold Group in Boston.

"What's key is being able to understand the flow of information through a site and the different systems that get it there," Bock said. That is a skill few marketers can provide, he said.

Finding a webmaster with a dense resume is easier said than

done. The demand "far outweighs the supply," said Alec Siegel, a senior associate at Halbrecht & Co., a Fairfax, Va.-based job placement firm that recruits Internet professionals for MCI Communications Corp., America Online, Inc. and other cyberhungry outfits along the Beltway, or "Netplex."

Mutual fund firms, stock brokers and other Wall Street entities are scrambling faster than other industries to carve out electronic commerce niches, said Bill Adiletta, president and chief executive officer at MarketVision Corp. in New York.

Surging demand for Web skills has allowed some cyberspace jockeys to command \$80,000 to \$110,000 or more in salary — plus stock options, sign-on bonuses and other perks — even with as little as three years' experience in the Internet trenches, according to recruiters and employers looking for Web workers.

"Prices for these people are all over the board right now. It's out of whack," said Ben Narasin, president of Internet Design Group, a

WEBMASTERY 101

Experts say there are must-have skills for webmasters. Everything else is gravy.

MUST-HAVE SKILLS

- A feel for aesthetics
- Knowledge of Unix
- Network administration know-how
- A sense of adventure

NICE-IF-YOU-GOT-EM SKILLS

- IS experience in retail or sales applications
- Hypertext Markup Language acumen
- Experience in producing or designing a newsletter, technical documentation or other publication

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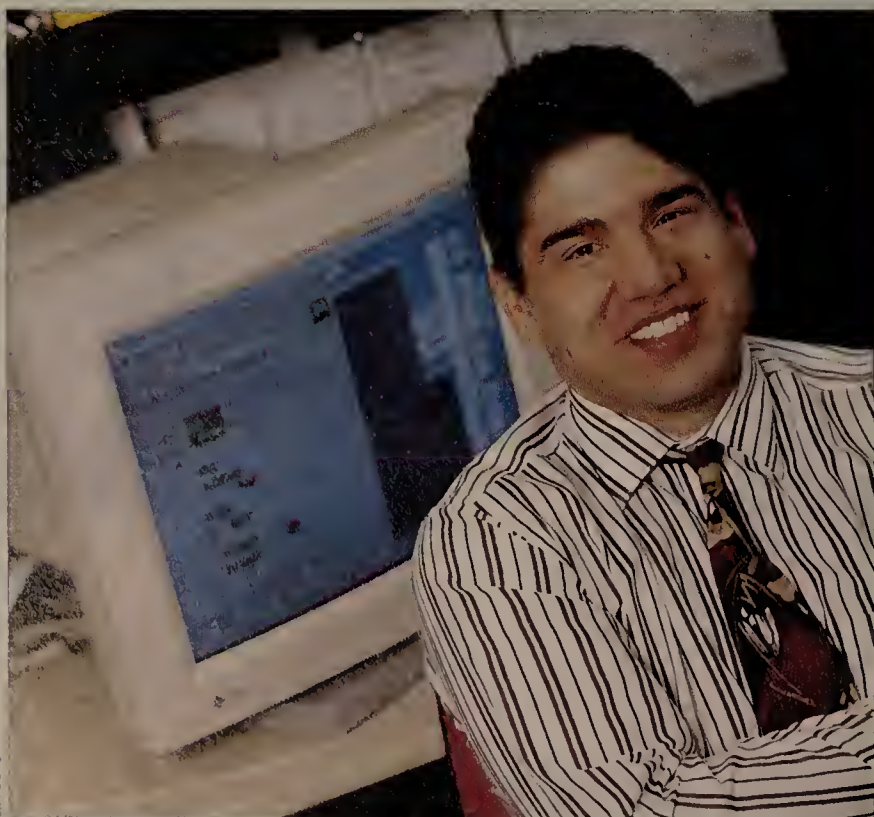


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The on-line eagle eye at UPS



Josh Cohen started at UPS as an IS intern in 1993 and today is a full-time network administrator. He often works on the company's server from his home PC and dials in to watch traffic patterns. "I just like to know what's what," he says.

Josh Cohen
Webmaster, communications analyst
United Parcel Service, Inc.
Mahwah, N.J.
<http://www.ups.com>

Background: Bachelor's degree in computer engineering from Lehigh University

Age: 24

Favorite on-line spots: Internet Underground Music Archives at <http://www.iuma.com/gdc/>. Cohen also maintains the Web site of Internet Relay Chat (IRC) at <http://www.early.com/ircd> and is involved in creating a new IRC protocol and various Web personals sites. "I've met two people that way. That's the sign of a true nerd, I know. Neither worked out in the long run, but it's a good experience."

Most important webmaster skill: No more than three years' experience at a given company. "You want someone as close to college age as you can get."

Hobbies: Electronic surfing and snow skiing

Josh Cohen isn't the only webmaster at UPS, but he does a lot of the grunt work, such as sorting and answering electronic mail.

Despite the fact that UPS's 24-hour, seven-day network operations center monitors the site, Cohen dials in to watch traffic patterns and "make sure everything's running OK," he said. "I just like to know what's what."

Cohen estimates that he spends an average of nine hours per day at work. But that doesn't include the time he spends fussing over the company's web server from his home PC or the times he gets paged on nights and weekends.

Now a full-time network administrator, Cohen started at UPS as an intern in the information systems department in the summer of 1993.

UPS's original site, which offered little interactivity and is now defunct, was launched in September 1994. The current site, which took two and a half months to build, gets 15,000 to 20,000 hits per day. It was launched in May 1995.

The idea for UPS's external web site came from both IS and marketing, Cohen said, which made it a fun project to tackle. "We didn't have to deal with a lot of the red tape that comes with other technology projects because people just wanted [the site] up and going as soon as possible," he explained.

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- (c) OS/2
- (d) Unix
- (e) Mac OS
- (f) Windows NT
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 - 60. Government - State/Federal/Local
 - 65. Communications Systems/Public Utilities/Transportation
 - 70. Mining/Construction/Petroleum/Refining/Agric.
 - 80. Manufacturer of Computers, Computer-Related Systems or Peripherals
 - 85. Systems Integrators, VARs, Computer Service Bureaus, Software Planning & Consulting Services
 - 90. Computer/Peripheral Dealer/Dist./Retailer
 - 95. Other _____
- (Please Specify)

2. **TITLE/FUNCTION** (Circle one)
- IS/MIS/DP MANAGEMENT**
- 19. Chief Information Officer/Vice President/ Asst. VP IS/MIS/DP Management
 - 21. Dir./Mgr. MIS Services, Information Center
 - 22. Dir./Mgr.: Network Sys., Data/Tele. Comm., LAN Mgr./PC Mgr., Tech Planning, Admin Svs.
 - 23. Dir./Mgr. Sys. Development, Sys. Architecture
 - 31. Programming Management, Software Developers
 - 41. Engineering, Scientific, R&D, Tech. Mgt.
 - 60. Sys. Integrators/VARs/Consulting Mgt.
- CORPORATE MANAGEMENT**
- 11. President, Owner/Partner, General Mgr.
 - 12. Vice President, Asst. VP
 - 13. Treasurer, Controller, Financial Officer

DEPARTMENTAL MANAGEMENT

- 51. Sales & Mktg. Management
- 70. Medical, Legal, Accounting Mgt.

OTHER PROFESSIONAL MANAGEMENT

- 80. Information Centers/Libraries, Educators, Journalists, Students
- 90. Other Titled Personnel

3. Do you use, evaluate, specify, recommend, purchase: (Circle all that apply)

Operating Systems

- (a) Solaris
- (b) Netware
- (c) OS/2
- (d) Unix
- (e) Mac OS
- (f) Windows NT
- (g) Windows
- (h) NeXTstep

App. Development Products ☐ Yes ☐ No

Networking Products ☐ Yes ☐ No

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Fidelity's team of webmasters includes (left to right) Ralph Folz, Don Goseboom, Cheryl Farmer, Dave Nolan and Tom Gernon

Fidelity splits Web work

Tom Gernon
Technical manager for
electronic services
Fidelity Investments, Inc.
Boston
<http://www.fid-inv.com>

Background: Earned undergraduate degree in computer science from William and Mary College in Washington

Age: 31

Most important webmaster skill: Layout and graphics experience, and general knowledge of distributed computing. "I wouldn't consider anyone who didn't have client/server experience... but specific Internet experience isn't a necessity."

Hobbies: Louisiana cooking and New Orleans-style jazz. "I used to play a lot of volleyball and soccer, but now I'm never home."

are distributed among several workers, inside and outside of information systems. Every link in the chain is equally important, according to Tom Gernon.

Gernon translates requests and concepts from marketing, sales, human resources and other departments into Web-readable and Web-accessible applications. It ain't easy.

"I can't imagine just one person being a so-called webmaster," Gernon said. "That [idea is] a holdover from the early days of the Web when small experimental projects were going on," he said, referring to ancient times circa 1994.

Gernon knows Hypertext Markup Language, the programming language of the Web. But he and co-manager Cheryl Farmer mainly oversee the design, construction and launch of on-line projects.

"My greatest fear is that Mirsky will pick up on something I do," he laughed, referring to a Web site called Mirsky's Worst that regularly, and quite comically, berates poorly executed Web pages.

Fidelity, like other companies, doesn't have a full-time webmaster. Instead, duties

"They feel like parents, and you know parents don't want to leave their children," said Mary Ruth Moran, senior vice president of electronic marketing at Fidelity.

Indeed, Tom Gernon, technical manager for Fidelity's electronic services, said he feels closer to the customer than if he were part of

the firm's central IS group.

"All our work — I mean all — is done toward solving customer needs," he said. "I like that."

The money and thrill of working with new technology may sound attractive, but longtime IS workers should look before they leap, several observers said.

While most IS professionals' work is relatively insulated from public scrutiny, that isn't so on the Web. What you build can be seen globally by roughly 6.5 million users with direct access to the Web.

That realization can be an unwelcome jolt for some technical professionals who aren't used to

exhibiting their creations, said Jill Marie Sellers, a webmaster at Wal-Mart Stores, Inc. in Bentonville, Ark.

Indeed, working on the Web is like being naked in public.

"Your work is out there for all to judge," Sellers said. "And there are plenty of judges, too."

Wal-Mart's Web woman

Jill Marie Sellers
Wal-Mart Stores, Inc.
Bentonville, Ark.
<http://www.wal-mart.com>

Background: Self-described "hard-core Unix propeller head" and former fashion model.

Age: 27

Favorite on-line spots: None. "I absolutely do not" get on-line at home.

Most important webmaster skills: Organization and deep knowledge of security technology.

Hobbies: Golf, as a stress reliever. "It's very simple compared to what I do on a day-to-day basis."

Sellers is part of a strong webmaster contingent: women.

In fact, the Web is drawing technosavvy females in greater numbers than traditional IS sectors, several users and analysts told *Computerworld*.

"That's because, at least in part, you need to combine a lot of technical knowledge with the ability to cooperate with people who don't know a lot of technology," Sellers ex-

plained. Women "can often be very good at that."

Handling both Wal-Mart's internal and external Web projects, Sellers typically works 10-hour days, starting at 7:30 a.m. However, she is quick to credit Web team members from all over Wal-Mart with making the retailer's on-line efforts a success thus far.

Sellers, a former runway model and owner of a graphic arts business, lives to shake up preconceived notions. "I'm trying to break the stereotype of a dumb blonde," she said. "When I talk Unix, people stand back."

Unix talk comes easy for Sellers, who has earned several technical certificates in the subject, although — like Microsoft Chairman Bill Gates — she does not hold a college degree.

She also knows network systems engineering and has a special place in her heart for TCP/IP. Previous work in marketing and graphic arts is "really, really handy," she said, adding that webmastery calls for equal parts of visual acumen and technical know-how.

Cybernauts at NASA

Daniel McCoy
Software engineer at I-Net, Inc.;
employed at NASA's Johnson -
Space Center in Houston since
1990
<http://shuttle.nasa.gov/sts-71/>

Nickname: "That Web Guy"

Background: Earned bachelor's degree in computer science from the University of Houston. Project experience includes X Window System tools development.

Age: 30

Favorite on-line spots: "Any sites that are eye-catching and make use of innovative techniques." Also interested in downloading information about on-line development tools.

Hobbies: Gardening, camping and "anything that gets me outside and away from my computer."

'net achievements: Began "fooling around" with Mosaic in early 1993. Became chief architect of NASA's Space Transportation System-71 Space Shuttle home page, which went live in June 1995. Has served as an Internet adviser to Johnson Space Center for the past two years.

One of the biggest Internet teams that *Computerworld* has encountered works at NASA.

NASA's group of 150 Internet specialists, who include HTML programmers, graphic artists and workstation and networking gurus, are young to middle-aged. Roughly 70% are male, according to Kelly Humphries, the "team lead" for information services at NASA's public affairs division. Humphries' division administers the Space Shuttle home page.

Humphries, a nine-year NASA veteran and a former newspaper reporter, said NASA's aim is to present its home pages to the public as "informational tools."

NASA's McCoy is typical of other cybernauts at the space agency; all seek to deliver electronic information "as a service to better mankind," Humphries said.

NASA's Space Shuttle home pages include detailed information about each mission. Visitors can click on buttons to access countdown data, launch information and even download photographs from a video gallery.

'NET FACTS



Number of domain names registered each month

DURING THE SPRING OF 1993:

400

AS OF OCTOBER 1994:

2,000

END OF 1995:

20,000*

TOTAL THAT EXISTS TODAY:

110,000

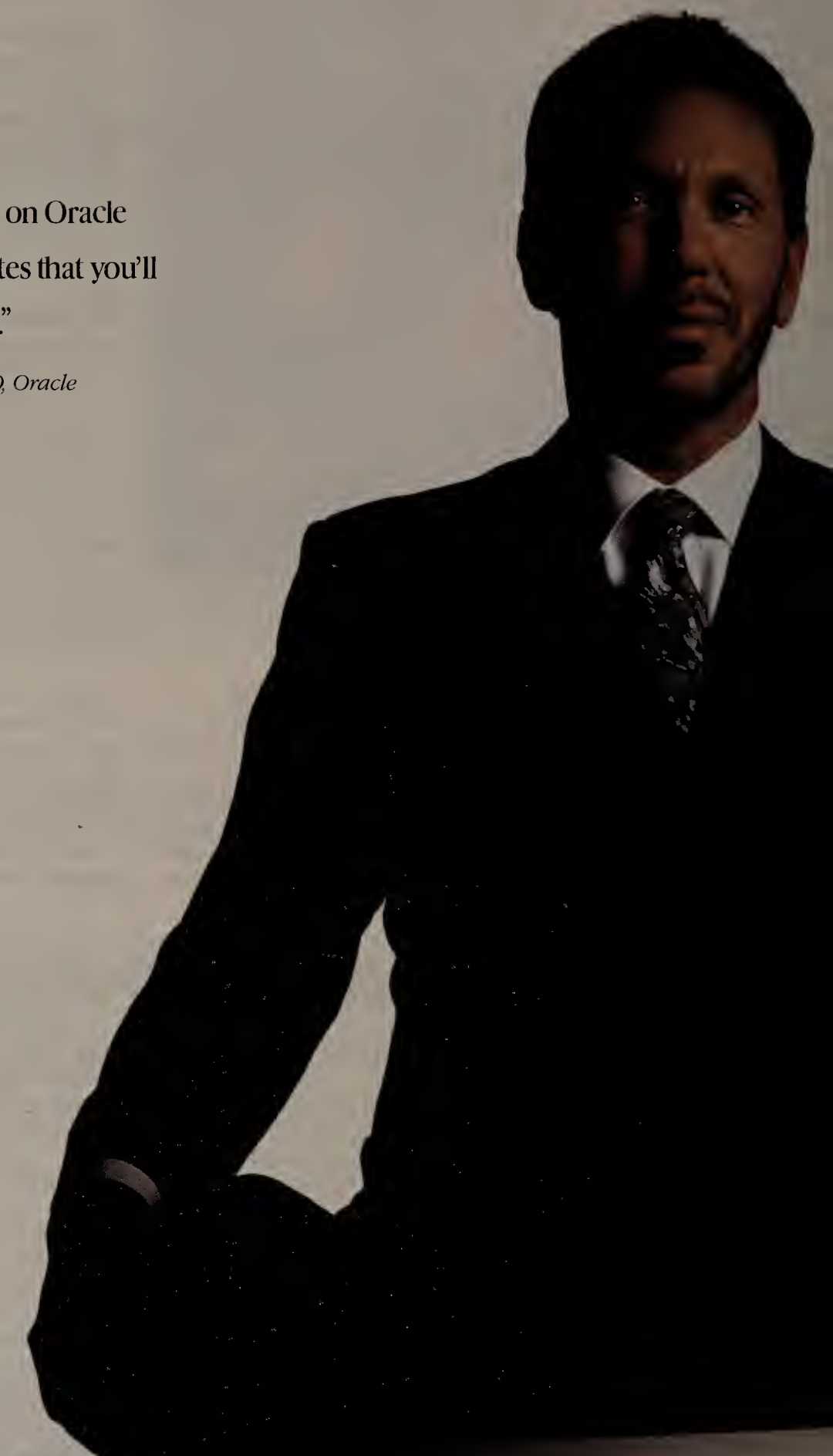
*Projected

Source: National Science Foundation, Arlington, Va.

Oracle's Larry Ellison on AT&T WorldMark Servers.

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Larry Ellison, Chairman and CEO, Oracle



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Editorial

Novel idea

A few weeks ago here, I lauded Novell's decision to refocus its efforts on its NetWare crown jewel after the company announced it was abandoning efforts to build a "super-network operating system" that would include Unix functionality.

There is mounting evidence that Novell must act even more aggressively to clearly delineate its enterprise strategy and shore up eroding confidence in NetWare.

Consider the information in our CW Guide, which begins on page 105. We polled corporate users about their overall satisfaction with their network operating systems.

NetWare, the clear market-share leader, finished last among the four network operating systems we included. NetWare was 30% behind the leader, which happened to be Microsoft's Windows NT, in overall satisfaction. NetWare got hammered in comparisons of overall performance, directory services and systems management. Of the five major categories of performance we measured, NetWare customers placed the product at the bottom in four of those categories and second from the bottom in the other one. And in our independent laboratory test comparing NT and NetWare, NT is a solid front-runner.



It is truly a good idea that Novell has moved away from the super-network operating system idea. But is that enough? I don't believe so. Dataquest recently produced numbers that show Microsoft has 90% of the market share in application suites. We ran a story last week about Novell's efforts to ship its PerfectOffice for Windows 95 suite sometime next year — late by several months. You can bet there's a frenetic effort at Novell to ship this product because Windows 95 sales are robust.

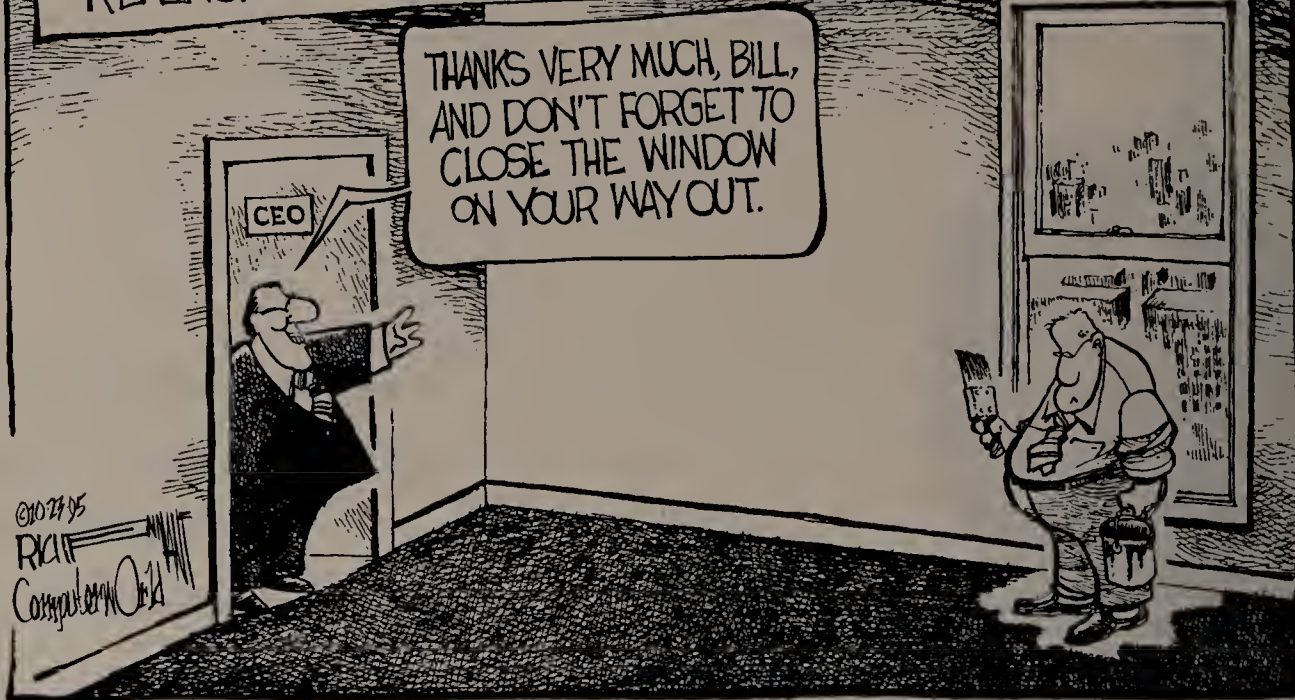
Is the application business, which was purchased from WordPerfect just before Novell Chairman Bob Frankenberg started his job, really worth the effort? Is that a battle Novell clearly has lost?

Paul Gillin, who regularly writes this editorial, wrote the week after Novell announced its intent to purchase WordPerfect that then-Chairman Ray Noorda should immediately pull the plug on the deal. I disagreed with Paul then, but he was right. It's too late for the company to get its money back. It's not too late to save NetWare.

Bill Laberis

Bill Laberis, Editor in Chief
Internet: bill_lab@cw.com

BILL DISCOVERS THE DOWNSIDE OF VOLUNTEERING TO RE-ENGINEER HIS ORGANIZATION.



Letters to the Editor

Salary survey came up a bit short

Computerworld's salary survey [CW, Sept. 4] is interesting as usual but is missing some important information.

Cost of living figures by region would tell readers much more. It's all well and fine that the western region salary increase was 4.4% in 1994-95. But if our cost of living increased at a higher rate, we actually have had a decrease in salaries.

The top of page 78 (Follow the Money) informed readers that the Midwest was the stingiest region for salary increases, but what we don't know is how much their cost of living increased. I suspect not nearly as much as other regions.

Jim Wilson
San Mateo, Calif.

Software program, by any other name

The publication of Daniel Pacek's letter chastising Joe Maglitta's use of the phrase "software program" surprised me [Letters to the editor, CW, Sept. 25].

I have been in the "tab machine, computer, data processing, information processing and information technology" field since 1951. Instructions written for computers, whether applications or systems, were originally called computer programs.

When the word software was first used in the early 1960s, the phrases "software program" and "computer program" were used

interchangeably and have been since then.

Joseph S. De Natale
The Clipper Group
Wellesley, Mass.
jdenatale@delphi.com

Progress, but at what price?

In your editorial "Slow speed ahead" [CW, Aug. 21], you left out the most important reason most businesses "hold back the adoption of new technology." They don't need it, or they don't need it at the price of new hardware and retraining.

I'd like to know, for instance, how much was spent acquiring multimedia technology because the information systems manager said the competition was buying it, and how much of a return chief executive officers can calculate on the outlay.

Richard H. Clancey
Brookline, Mass.
rhc@world.std.com

On-line play time stunts productivity

In "Ban on-line play at work? Don't!" [CW, Sept. 4], Edward G. Prentice says that "positive motivation" will persuade people to use their time better, quit playing games and be more productive overall. However, a recent survey by Coleman & Associates, Inc. in Teaneck, N.J., found that 23% of PC

game-players said their most recent game-playing was at the office rather than at home.

Assume there are 40 million PCs in business and government, and each one is used to play games for half an hour a week. At a fully loaded cost of an employee hour of \$50 per hour, we are talking about a loss of \$1 billion a week, or \$50 billion a year. Is this where our trade deficit lies? This is what games cost American productivity in one year. Can we afford to experiment with the "positive motivation" theory while we bleed money like this?

Many people say that if someone wants to goof off, he will do it anyway. I disagree. When the opportunity avails itself, PC games will be used. Would you equip every employee's office with a poker table, golf practice tee, five arcade game boxes and the promise that no one will care if he/she plays during work hours?

Games at work are just another form of computer virus that attacks productivity. The computer industry learned to cope with viruses by deleting them from computer disks. It must learn to cope with this more costly danger.

Dana Hollander
DVD Software
Irvine, Calif.
UngameSup@AOL.COM

More letters, page 41

■ Computerworld welcomes comments from its readers. Letters should not exceed 200 words and should be addressed to Bill Laberis, Editor in Chief, Computerworld, P.O. Box 9171, 500 Old Connecticut Path, Framingham, Mass. 01701. Fax number: (508) 875-8931; Internet: letters@cw.com. Please include an address and phone number for verification.

Brett D. Arquette

Computer-room tours go downscale

Am I the only IS manager who can no longer define a mainframe or server simply by looking at the size of the machine? It used to be easy, but things have changed — and they aren't done changing.

The industry persists in sticking labels on technology that changes faster than Superman in a telephone booth. When a company announces it will "upgrade to a downsized, mid-size computer in order to rightsize the organization," it leaves me with an oversize headache.

Most midsize computers are smaller but faster than the machine they're replacing. Is that really downsizing?

My shop recently unplugged a Digital VAX 6630 because we were pegging it and needed more power. In place of the big box, we bought a Digital Alpha 2100 4/275 Server. This tiny little thing — smaller than a microwave oven — surely must be a server. It says "server" right on the cover, but it sure acts like a mainframe.

Even I know that mainframes are big, expensive, heavy industrial pieces of iron that can't be picked up by just a Cub Scout. It normally takes 2.35 Digital technicians to move a mainframe. My bosses freaked when they saw the little Alpha server. I believe the exact remark was, "I hope you know what you're doing."

After loading Digital's VMS Version 6.1 and bringing on 700 users, I held my breath in hopes that this little box that says "server" on

it could function like a mainframe and handle the workload of a 400-user database and a 300-user office automation package. I was amazed when it used only one-third of its power at peak hours.

How powerful does a server have to be before it's considered a mainframe? If I described a 64-bit machine that could hold 14G bytes of core memory and had 12 300-MHz processors, would you guess it was a mainframe or server?

Oracle and Digital recently announced a joint venture called the Very Large Database Concept, which ultimately means you could load your entire database into 14G bytes of core memory on the Digital 8400 Alpha Server (running VMS Version 6.3) and get unbelievable results.

Because all data calls are made directly from memory, the speed of this configuration is outrageous. Reports that take days to produce could take minutes. The same machine also can be configured as a server. So what is this hardware monster? Mainframe or server?

I have found an area where size definitely counts: It's not very impressive anymore to give the old computer-room tour. Everything, including 40 disk drives, four controllers and tape drives, fits into a single, 19-in. rack that stands in the middle of an empty computer room that could be used for racquetball. It looks like a shrine for a solitary totem, entombed in tile, white walls and glass. (It's also hard to justify one's salary when standing next to such an unimpressive rack.)

Never again will I hear the wonderful words, "Wow, you run all this?" Now the tour takes 10 seconds and consists of phrases such as, "There it is. Are you ready to go?"

In a few years, the already fine line between servers and mainframes will evaporate, and a new product buzzword will be invented. I can just hear it now, "Yeah, we just downgraded in order to upsize to the new serv-frame."

Arquette is IS manager at the Ninth Judicial Circuit Court of Orange County, Fla.



Is it a server or a mainframe? The already fine line is starting to disappear.

Michael Schrage

Revisiting *The Mythical Man-Month*

Twenty years ago, Paul Allen and Bill Gates shipped their first copies of Microsoft Basic and IBM software guru Fred Brooks published *The Mythical Man-Month*. Today, "Billionaire Bill" Gates is the richest man in America and Fred Brooks, chairman of the University of North Carolina computer science department and not quite a billionaire, has issued an updated anniversary edition of TM³.

Who do you think has had a bigger — and better — influence on software quality?

In an ideal column, Gates would review *The Mythical Man-Month* and Brooks would offer insights into Michael Cusamano's and Richard Selby's

Microsoft Secrets, an exhaustive (if occasionally exhausting) analysis of Microsoft's software development practices.

What Gates has to say about Brooks' design and management philosophy — Brooks was, after all, the man responsible for the IBM 360 operating system — would be well worth noting. Similarly, Brooks' take on today's most successful software company should be of serious interest to Mr. Bill.

Intriguingly — sadly? — Brooks gets but a

single mention in *Microsoft Secrets*. Then again, one of the book's sharper criticisms of Microsoft is that it has a tendency to reinvent wheels. To parallel process these books is to rediscover software's painful truth: Design is easy; managing development isn't.

Actually, these books are far less about software development than about managing people.

Remember, Brooks' title mocks the idiotic pretension of the "man-month" metric by pointing out that adding people to a failing project actually makes things worse. The IS management myth that programmers are interchangeable units in software development is truly a destructive one. *The Mythical Man-Month* has as much to say about effective management as anything written by Peter Drucker or Tom Peters.

To be sure, Brooks and Gates emphasize the importance of small, nimble teams, rapid prototyping and honest metrics. Microsoft's practice of daily builds, usability testing and pitting testers against coders has become part of the Redmond, Wash., company's development culture. The company's "sync and stabilize" ap-

proach, detailed in *Microsoft Secrets*, echoes the best practices articulated by Brooks two decades ago.

Yet it's crystal clear that Microsoft is running full bore into precisely the same management issues that Brooks so artfully identified a generation ago.

The most provocative — and disconcerting — message in these books is that Gates and Brooks place the highest priority on getting top-notch people. When Brooks was at IBM, the world's largest computer company had its pick of software talent. Today, Microsoft gets the very best programmers from MIT, Carnegie Mellon and the rest of the world. Yet, despite being able to get the world's top talent, Microsoft has management challenges that remain hardy perennials. So what hope is there for the organizations left with the average talent?

The only rational conclusion is that management, metrics and methodologies will have to become even more important to the software development process than individual programmers. Optimizing the development system may prove more useful than optimizing the development individuals.

Schrage is a research associate at the MIT Media Lab. His Internet address is schrage@media.mit.edu.

Two books reinforce the point that software design is easy compared with managing development.



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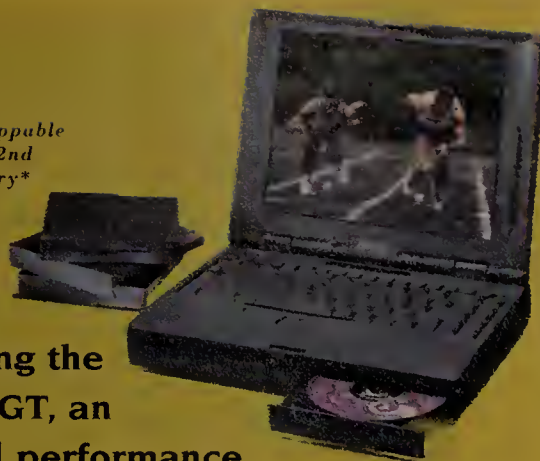
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America Online not the only game in town

I found Gary Beach's criticism of America Online ["More service, less whining," CW, Aug. 14] unnecessarily mean-spirited. And Joe Warren's response ["Letters to the editor," CW, Sept. 18] was ridiculous, in particular his statement that if America Online changed its outage times to be less "East Coast-centric," someone would then complain that it had become too "West Coast-centric."

If you don't like America Online, why don't you make your suggestions for improvement to the people who can do something? Then leave the service if it doesn't improve to your satisfaction.

Come on, guys; don't forget you live in America. Competition generates superior services and goods. America Online isn't the only game, so why all the fuss?

Tony Garciaserra
TonyG246@aol.com

Do Jobs and Wozniak know about this?

The shock of discovering in the "productivity/technology" timeline ["Premier 100," CW, Oct. 9] that Windows was announced in 1983, before the Macintosh was introduced, leaves me speechless!

To give Bill Gates credit for the graphical user interface is to buy into the Microsoft snow job a little more than necessary. I imagine Steve Jobs and Steve Wozniak are shaking their heads.

John S. Williams
Atlantis, Fla.
jswilliams@aol.com

Apple paying the piper

How long is this Macintosh vs. Windows battle going to go on? ["Letters to the editor," CW, Oct. 9] The letter writer is still trying to deal with this issue as if it were a technology beauty contest. If it were, we'd all be using Macintoshes or Next computers. Apple made a strategic blunder in 1989 and 1990 when it ignored pleas to license and open its technology and so grow the market. Consequently, Microsoft cleaned Apple's clock with a clearly inferior product. I suspect that before it is over, Apple will ascend to a lofty place among MBA case studies: "How to really screw up a good situation" might be a suitable title.

Barry Walsh
Indiana University
Bloomington, Ind.
BWalsh@indiana.edu

Usenet is no way to screen job applicants

In "Privacy fades for Web visitors," [CW, Sept. 25] Steve Madere, president of Deja News, talks about checking job applicants' Usenet posts to see if they post in "intelligent or offensive" ways.

He also says, "You cannot possibly be

concerned about privacy if you deliver a message to thousands of machines worldwide."

I most certainly can be concerned about privacy, especially if you're going to use a post to a newsgroup to evaluate whether or not I should get a job.

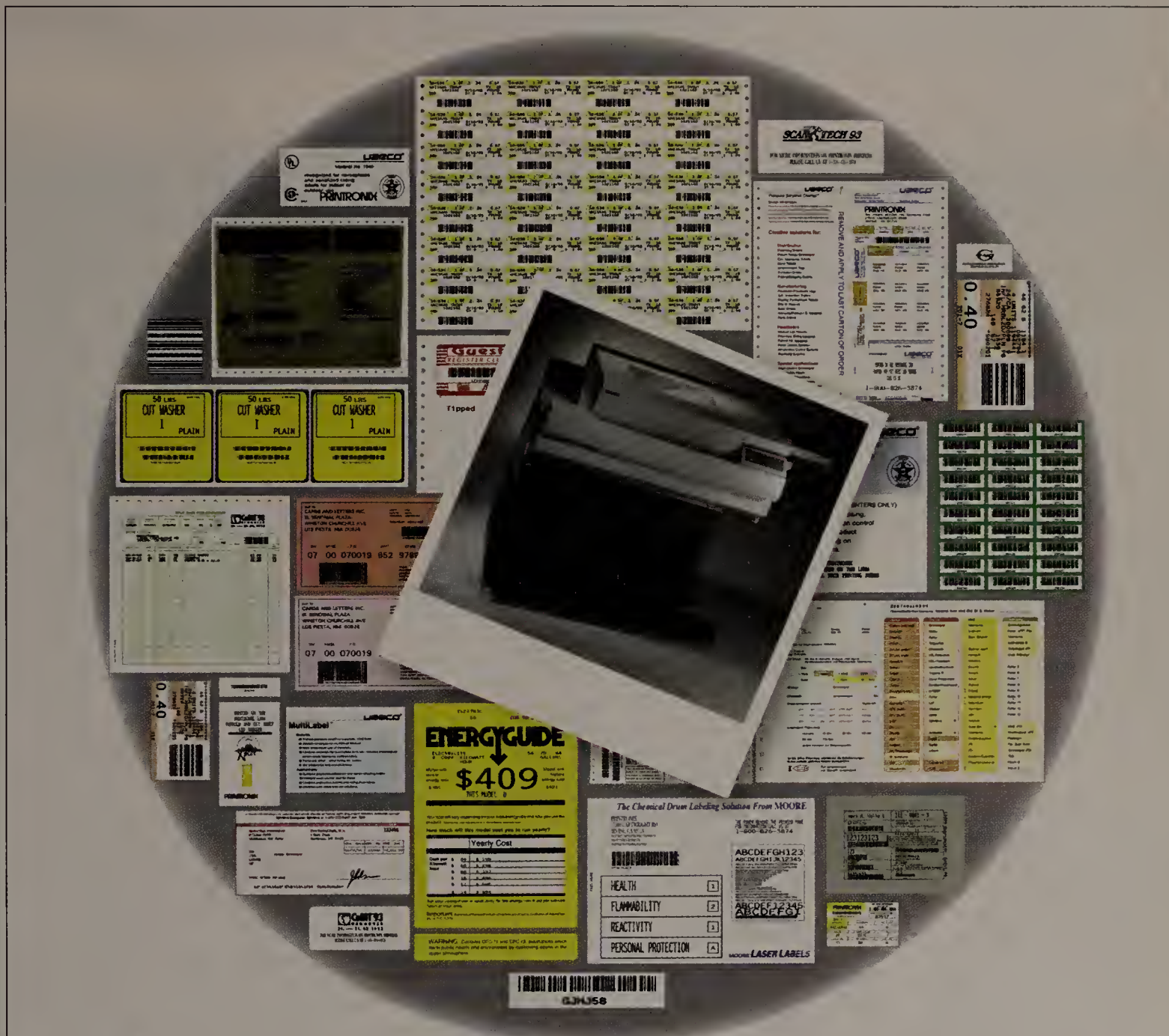
When I post to newsgroups on the Internet, I'm doing so in my leisure time, not as a professional.

Evaluating me based on Usenet posts

that aren't related to my business pursuits is like sitting next to me at a bar and, without my knowledge, using my conversation to determine whether I should be hired.

Just because you *can* search for posts doesn't mean you *should* search for them.

Alan Tignanelli
North Versailles, Pa.
penguin908@aol.com



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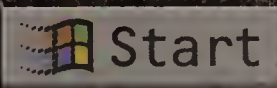


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In the spirit of doing more with less, Network congratulates this year's Premier 100.



Wall Street bullish on Mac

Despite Apple's neglect, the Mac is loved by some big guns in financial industry

By Lisa Picarille

Some investment banking firms are putting Macintoshes where their money is.

A handful of large financial institutions, including Alex. Brown & Sons, Inc., J. P. Morgan, Montgomery Securities, Swiss Bank and the New York Stock Exchange, use Macintoshes as mission-critical parts of their business.

Macintoshes are being used several ways at these financial firms — as replacements for proprietary stock quote machines, primary systems on the trading floor and desktop systems for financial analysts and consultants.

Most users said they chose the Macintosh for its ability to display complex graphics, its networking capabilities, ease of use and the minimal support it requires.

Apple has traditionally focused on, and is re-emphasizing its commitment to, several key markets, Apple executives said. These key markets include

desktop publishing, graphics, multimedia and education. The vendor has had several failed attempts to break in to the business market, according to observers.

"I think Apple has neglected to market to this segment," said John Coulter, manager of business development at Ease Technologies, Inc., a Columbia, Md., developer that sells hardware and software to financial institutions. "The Mac offers so much in terms of ease of use and multitasking that it's a natural for a clientele base that doesn't understand technology. Traders don't know computers, so the Mac OS is the best because it's got the quickest learning curve."

Macs, Macs and more Macs

In some cases, the Macintosh coexists with Unix workstations that dominate Wall Street. But some firms are choosing Macintosh-only solutions.

Baltimore-based Alex. Brown & Sons, which runs one of the nation's largest trading floors outside New York, three years ago made the decision to update its technology and

went with the Macintosh.

"We couldn't hire anyone because the technology was so outdated that we couldn't add any more people to the system," said Bob Silbaugh, administrative manager of trading at Alex.

Brown. The firm uses 90 Macintoshes and plans to roll out more to its offices in San Francisco, Boston and New York by the end of the year.

Before it decided to move to the Macintosh, the company used a variety of proprietary stock machines and quote computers. None of the equipment was integrated.

"Some people had five and six keyboards on their desks," Silbaugh added.

Now Alex. Brown's traders can get information such as market data, stock quotes, news, charts, historical

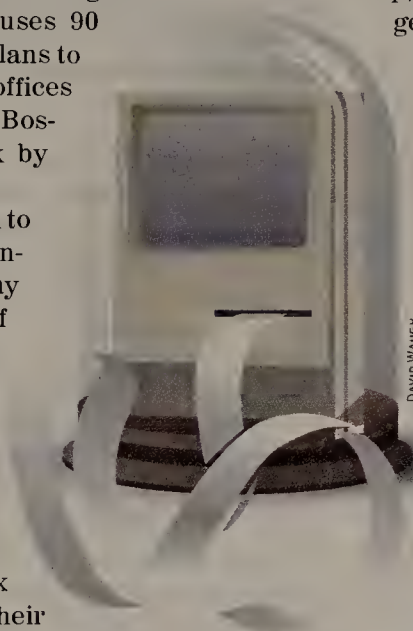
data and databases — all viewed from a single screen on the Macintosh and accessed via a single keyboard, Silbaugh said.

John Pappa, president of The Carson Group, a capital markets intelligence firm in New York, also uses Macintoshes.

The firm has more than 100 Macintoshes, which are used to pull together a variety of stock information and market data to help the company analyze and identify who is buying and selling stock.

"The Macintosh gives the individual the information right on the desktop instead of walking over to a dedicated machine, doing a query and printing it out," Pappa said. Instead, analysts

can do it all from one machine, "and that makes them more efficient," he added.



DAVID WAUGH

Zenith does notebooks

By Mindy Blodgett

Zenith Data Systems last week jumped into the high-end, multimedia, Pentium portable computer market with Z-Note GT.

The Buffalo Grove, Ill.-based Ze-

nith Data also introduced a mid-range notebook — Z-Note MX — that it hopes will jump-start its drive to become a player in the notebook field. Randal Giusto, an analyst at International Data Corp. in Framingham, Mass., said the portables,

which cost \$3,999 to \$5,699, are priced "fairly aggressively."

But Giusto said the market is crowded with multimedia offerings, and Zenith Data will have to work hard on the marketing to stand out. "At this point, that is what it is all about," he said.

Ken Dulaney, an analyst at Gartner Group, Inc. in Stamford, Conn., agreed that the multimedia notebook market has become increasingly competitive.

Z-Note GT has a 90-MHz Intel Corp. Pentium processor with an 11.3-in., high-resolution screen, an optional internal Motion Picture Experts Group card and a full-motion, full-screen video board with a modular CD-ROM drive. It simultaneously supports Type II and Type III PC cards. The Z-Note GT with CD-ROM drive weighs 7.9 pounds.

The Z-Note MX with a 75-MHz processor has a 10.4-in. screen with memory expandable from 8M to 40M bytes to support applications such as Microsoft Corp.'s Windows 95. It weighs 5.9 pounds.

Microsoft to add telephony to NT

By Stuart J. Johnston

Microsoft Corp. will add telephony support to Windows NT next year, clearing the way for hardware and software developers to build client/server telephony systems based on NT.

The inclusion of the code to support computer/telephone integration (CTI) applications — called the Telephony Applications Program Interface, or TAPI — will come in the next release of NT sometime next year. That version will also give NT the Windows 95 user interface.

Telephony tasks

CTI applications may be as mundane as enabling users to retrieve voice messages from their networked PCs or as complex as sophisticated telemarketing systems, said Hank Koerner, product marketing manager at Digital Systems, Inc. in Redmond, Wash. Digital Systems, which builds such systems, has also endorsed TAPI on NT.

Beta code for TAPI support on NT will be available Microsoft, page 48

Zenith Data's Z-Note GT and Z-Note MX portables include the following features:

Z-Note GT

- 11.3-in., high-resolution, active-matrix, thin film transistor screen and multimedia features such as CD-ROM.
- 64-bit mobile 75- or 90-MHz Pentium processors.

Z-Note MX

- 75-MHz Pentium processor and 10.4-in. screen.
- Room for two Type II or one Type III PC card.



Z-Note GT

FileMaker brings relational database to the desktop

By Cheryl Gerber

Relational database capabilities will land on end-user desktops when Claris Corp. ships the 32-bit version of its FileMaker database software this December.

On both the Macintosh or Microsoft Corp. Windows 95 platforms, FileMaker Pro 3.0 is receiving thumbs-up from beta testers. "This is 200% better than the previous flat-file version," said developer Peter Lock at APS Online, a subsidiary of America's Payment Systems, Inc. in Los Angeles.

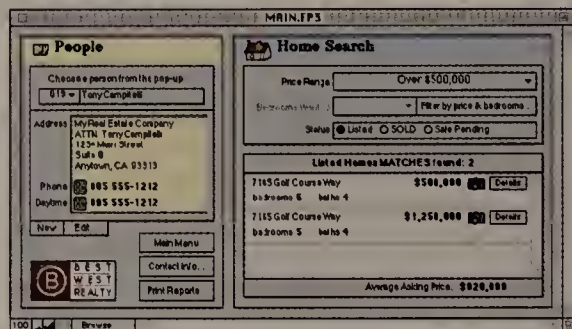
Lock has used the software on both platforms, although he said he prefers the Macintosh. He cited FileMaker 3.0's text rulers, indexing and import/export capabilities as improvements in what he regards as a re-engineered product.

Big improvement

Compared with FileMaker Pro 2.1, Version 3.0 also works better with existing flat files, said Bob Cusick, director of technical services at Working Software Solutions in Simi Valley, Calif.

Cusick said the most useful new features in the forthcoming version include the relational ability

to link disparate databases, conditional scripting and enhanced ScriptMaker. Users can also work both in flat-file or relational database mode, he said.



Claris' FileMaker Pro 3.0 allows users to work in flat-file or relational database mode

A flat-file database can only look up and copy data, while a relational database can do a calculation or make a change in one database with the result automatically appearing in another.

Conditional scripting allows users to establish actions based on "if, then, else" conditions to check one piece of data or many pieces of data. Claris has also enhanced ScriptMaker, the format used to create templates, by automating previously manual functions and adding more menus.

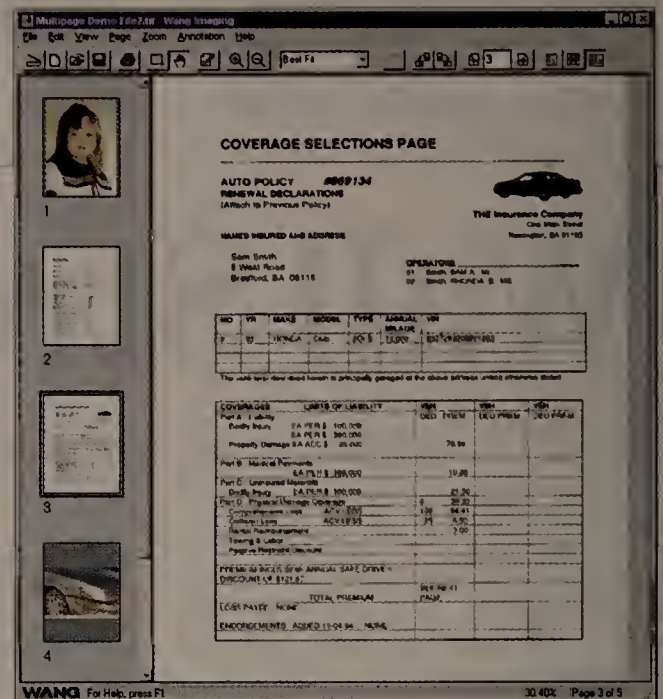
Both beta testers said the beta version is stable enough for the product to meet its December ship date. They also said converting FileMaker Pro 2.1 database files to Version 3.0 relational files is an easy, menu-driven process.

About the files

Users can retain their files in flat-file mode or create files that are related to other files. A new "Look-Up" feature, for example, allows users to paste related data between files.

However, one beta user cautioned that the addition of relational capabilities will require users to know more.

"If it's a flat-file database, a user can learn how to build a database progressively and instinctively. But if it's relational, you can't just do it on the fly," said Ken Graham, a consultant at Technology Partners in New York. "You have to plan it in advance. Users are going to require more support for 3.0 than they did for the previous version."



Wang's new image

Wang Laboratories, Inc.'s image viewer, code-named ImageVue, will be available by December as a free add-on to Microsoft Corp.'s Windows 95, according to the Billerica, Mass., firm. The software will provide users with a way to scan paper files, view and send faxes, annotate multipage image files and create image documents.

Industry observers said they expect the viewer to increase the visibility of imaging at the low end. For those who want more, Wang plans to offer an upgrade product, for an as yet undetermined price. This shrink-wrapped version will provide optical character recognition and other features to improve image presentation. — Tim Ouellette

Microsoft adds telephony to NT gear

CONTINUED FROM PAGE 47

to developers this fall, said Charles Fitzgerald, a product manager at Microsoft's Personal Systems division.

Eighteen major vendors of telephone-switching and voice-processing equipment said they will build products that work with NT-based TAPI.

While support for TAPI on client systems is available for Windows for Workgroups and in Windows 95, several analysts said TAPI support on the server is the key to implementing complete systems.

Although many companies already have TAPI-based products based on Windows for Workgroups out today, this is still a nascent market. The addition of a TAPI-compliant server operating system that works with TAPI clients will likely help kick-start broader acceptance, according to several analysts.

Jim Burton, president of C-T Link, Inc., a telecommunications consultancy in Boston, said he sees Windows 95 as the "launching point" for integrating telephone equipment and computers. But he added that the real impetus for such a move will occur in about a year when server support on NT arrives.

This will enable users to choose Windows 95 or Windows NT to run client-side applications and Windows NT to run the server applications for CTI, said John

Dunkle, president of Workgroup Strategic Services, Inc., a consultancy in Portsmouth, N.H.

Microsoft's strategy to make NT available on all the major chip architectures also bodes well for TAPI, Dunkle said.

NT is "garnering considerable success vs. Unix, [so] we see it as a major platform for CTI," said Dave Coleman, senior manager for CTI at Northern Telecom in Santa Clara, Calif., which also has signed on to support TAPI.

NT sales

International Data Corp. estimated that Microsoft will sell nearly 400,000 new units of Windows NT Server this year and nearly 500,000 new units of NT Workstation.

Translation please

Jamie Lewis, president of The Burton Group, a Salt Lake City research firm specializing in LAN architecture issues, said he tries to translate CTI and TAPI from the mumbo jumbo of technology into human terms. For example, he said, if a human resources manager brought on a new employee, it would be much simpler if the manager could put the new person's name in a single directory. That directory

would function as both a global network electronic-mail and workgroup privileges directory as well as a corporate phone and voice-mail directory.

Today, those functions are separate and are individually administered. "In that it will integrate network directories with telephone directories, [TAPI] will make things more manageable," Lewis said.

For users, it's decision time

Having common programming interfaces on the client and server may prove to be a powerful inducement for developers and users when it comes to choosing between Microsoft's TAPI and Novell, Inc.'s competing standard, called Telephony Services API (TSAPI), observers said.

Neither standard offers both client and server sides right now. TSAPI focuses on the server side, and TAPI doesn't yet feature server support.

More than 40 server applications that use TSAPI already exist, while TAPI support on Microsoft's Windows NT Server is a year or more away, said Ron Cully, product line manager for telephony services at Novell in San Jose, Calif.

Stiff competition

When TAPI on NT does arrive, that doesn't mean Microsoft will be the automatic winner either, Cully maintained. He cited Microsoft's lackluster success with its original OS/2 LAN Manager in the late 1980s as a case where users and developers chose Novell over Microsoft.

Still, "most [industry] players are looking at NT as a server platform," rather than using Novell's NetWare Loadable Modules, said Jim Burton, president of C-T Link. — Stuart J. Johnston

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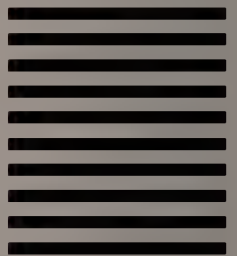
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Desktop Computing

Got old, washed-up PCs? HP offers cold hard cash

By Mitch Wagner

Looking to get rid of an ugly old futon or your complete collection of Barry Manilow on 8-track tape?

Then you're on your own.

But if you are an information systems manager looking to unload your company's obsolete PCs and workstations, Hewlett-Packard Co. hopes to offer a solution. HP plans in January to launch a program to buy any vendor's PCs and workstations from companies that no longer need them. HP will offer cash in return for the machines.

"If you're getting rid of 360 HP LaserJets and a few hundred PCs, we'll give you a price quote for what it's worth," said Craig White, general manager of the finance and remarketing division at HP's corporate consulting unit, Worldwide Customer Support Operations.

Quotes of note

IS managers will be able to get price quotes by dialing in to a dedicated telephone line and using their Touch-Tone phone to punch in the number of units they want to sell and information on the makes and models. The HP appli-

cation will automatically generate a quote, White said.

There won't be any strings attached to the buyback program, but HP hopes the program will

PC buyback

steer its salespeople into large corporate accounts.

"We hope when companies replace that equipment, they'll do it with Hewlett-Packard equipment," White said.

Use it up

Duncan Wilcox, vice president of IS at Nicholas Applegate Capital Management in San Diego, said the HP buyback program could be a way for his company to gain cash benefits from old systems after they have been passed along from users who need maximum power to less-demanding users.

"Typically, they work their way down the food chains. Right now, our standard configuration for an investment professional is a 100-MHz Pentium with 64 or 128M bytes of RAM. When the investors are done with it, it gets rolled down to operations and to an administrative level and so forth,"

A good cause

Chevron Information Technology donates old PCs to local charities and schools, as does Nicholas Applegate Capital Management.

Wilcox explained.

Rose Taylor, general manager of planning and architecture at Chevron Information Technology Co. in San Ramon, Calif., agreed. "As we bring in new equipment for our power users, we redeploy that equipment to people who

don't need the latest and greatest, and then redeploy it again," she said.

Once HP has the old systems, the machines might be reconditioned or resold to companies that break them down for parts. Some companies even resell individual screws and melt down motherboards for their rare metal content, White said.

Allie Young, an analyst at Dataquest, Inc. in San Jose, Calif., said she expects the HP buyback program to be very successful. "I think there'll be a lot of demand," she said. "IS departments are being asked by users to be at the leading edge of technology, but what will they do with their old equipment? Suddenly, they've got closets full of old PCs that are fully depreciated, and they have to get rid of them."

Briefs

Nexgen woos, wins executive

Nexgen, Inc., a start-up maker of microprocessors, scored another personnel coup by hiring Keith Diefendorff, chief strategist behind the PowerPC chip architecture jointly developed by Motorola, Inc., Apple Computer, Inc. and IBM.

Copiers connect directly

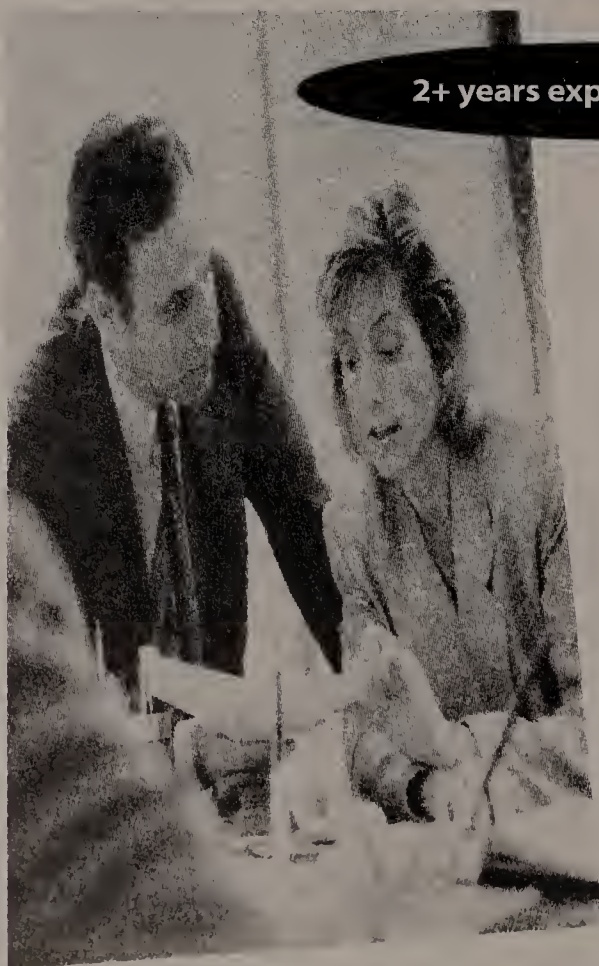
In what Xerox Corp. billed as a "major milestone," the company has introduced a line of digital copier/printers that will be directly connected to office computers. The devices will differ from traditional copiers in that they will receive documents directly from desktops and print them as ordered. The two products, the Document Centre 20, which will cost \$19,495, and the Document Centre 35, priced at \$38,610, will be cheaper and faster than the low-speed laser printers used in offices today, the vendor claimed.

You oughta be in pictures

Compaq Computer Corp. and PictureTel Corp. have developed an entry-level desktop videoconferencing system designed for PCs running Microsoft Corp.'s Windows 95. The PictureTel Live PCS 200 add-on kit is based on the H.320 standard, runs over Basic Rate Interface Integrated Services Digital Network lines and costs \$1,995.

Microsoft buys stake

Microsoft has recently purchased an undisclosed minority stake in Individual, Inc., an electronic news service based in Burlington, Mass. The companies plan to create a user-customized news delivery service for The Microsoft Network (MSN) on-line service next year. In the meantime, Individual's existing INews daily news bulletin will be available on MSN.



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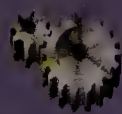
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How I walked four miles in a 9,000 square foot office.

each draft back with comments, and incorporate those comments into my document by the

following morning. So I basically faxed and copied and

delivered and then typed and re-typed and re-faxed and



re-copied and re-delivered until my feet hurt and my legs were tired and I was sitting there

starting to wonder why the heck running shoes aren't considered standard business attire.

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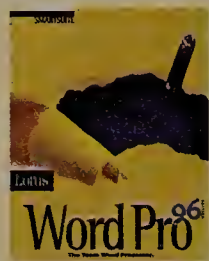
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New Products

Connectware, Inc. has introduced AirPrint, a wireless printing adapter.

According to the Richardson, Texas, company, AirPrint lets PC users share up to eight printer resources without a network or the physical restraint of wires. It attaches directly to the parallel port of either a computer or printer and doesn't require cards or software drivers.

AirPrint is compatible with existing LANs and lets users place printers close to them rather than where the wires dictate. It has a range of 3,000 feet unobstructed or approximately 500 feet with wall, ceiling and floor obstructions.

An AirPrint adapter set, which includes a connector, software and adapter, costs \$450.

► **Connectware**
(214) 235-9060

D. W. Witte and Associates, Inc. has released Rumor, a software tool for economic evaluation and risk analysis of technology projects.

According to the Plano, Texas, company, Rumor lets users review and analyze multiple aspects of project completion, including probability, budgeting, benefit, risk and several intangibles, while planning technology projects.

Rumor guides users through functions, including pro forma cash flow (using planned-, best- and worst-case scenarios), net present value, internal rate of return, component risk, component life and life-cycle risk.

Pricing for Rumor starts at \$5,000 for a site license.

► **D. W. Witte and Associates**
(214) 964-7602

Thompson Network Software has introduced The Doctor Anti-Virus for Microsoft Corp.'s Windows 95.

According to the Marietta, Ga., company, The Doctor Anti-Virus for Windows 95 provides on-demand, real-time signature scanning of disks and individual programs. It includes a Virtual Device Driver that automatically checks for viruses on floppy disks and programs before they can infect a system.

The product is written specifically for Windows 95 and supports long file name formats and 32-bit architecture.

The Doctor Anti-Virus for Windows 95 costs \$29.

► **Thompson Network Software**
(404) 971-8900

Polaroid Corp. has introduced ProPalette 8000, a digital color film recorder.

According to the Cambridge, Mass., company, ProPalette 8000 produces 35mm, professional-quality positives and negatives at 8,000 lines of resolution for users who need photographic-quality output from the desktop. It creates 24-bit images with 36-bit/pixel precision in more than 16 million colors.

The ProPalette 8000 has an internal 7-in. CRT, autoexposure, color balance controls, custom optics and addressable

resolution. It was designed for professional laboratories, mini-laboratories and in-house service bureaus. It uses a parallel or SCSI interface with Macintosh or Windows-based PCs.

ProPalette 8000 costs \$13,995.

► **Polaroid**
(617) 386-2000

Inset Systems, Inc. has unveiled HiJaak 95, a graphics application for Microsoft

Corp.'s Windows 95.

According to the Brookfield, Conn., company, HiJaak 95 lets users view a graphic image and convert, copy, print and update its features. The product supports 75 graphics formats along with Microsoft's OLE 2.0 and multitasking. It can convert any file, including word processing documents, spreadsheets and computer-aided design drawings, to any HiJaak-supported raster or meta file

graphics format with the HiJaak Print Capture printer driver.

HiJaak 95 creates thumbnail views of any image, using background processing. These color thumbnail images replace the generic operating system icons and are visible from the application's Explorer Network Neighborhood.

HiJaak 95 costs \$49.

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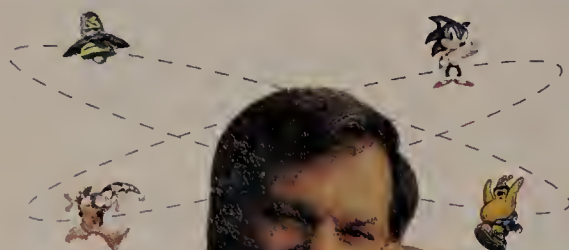


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When your business grows from zero dollars to a billion dollars in five years, choosing a client/server system that can keep up with the growth is pretty important.

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Spalding Sports' imaging, workflow system on tap

By Tim Ouellette

Spalding Sports Worldwide has stayed on the ball by using imaging and workflow software to improve its product development process.

After installing a Windows-based image retrieval system in its engineering department to cut down on product development time, the Chicopee, Mass., sports equipment maker decided to roll out the software to all its departments. The next step in the plan is to cut down on paper use and create automated workflows.

The imaging system has allowed product developers to create, disperse, comment on and update specifications on-line without being delayed by searching for paper copies of the specs and mailing them to offices worldwide.

Improving the process

With the system, Spalding is handling twice as many specs and associated updates, while cutting development time from a year and a half to a matter of months, said Ed Parrot, a technical information systems consultant at Spalding.

More important, most employees have been willing to try the software because the imaging and workflow system wasn't installed to cut

costs and jobs but improve productivity, said Harry Brooks, head of operations research.

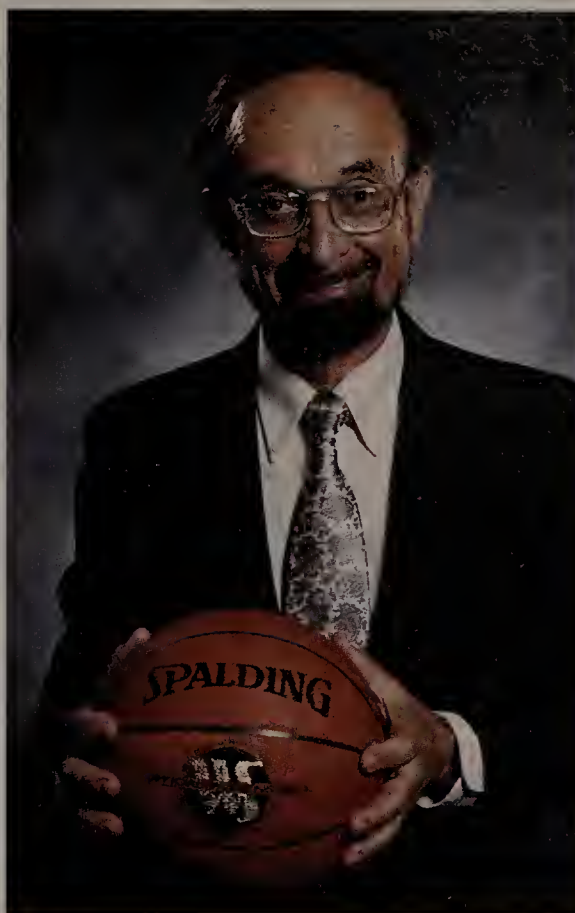
Imaging software transfers paper documents to a computer image file, while workflow software automates the movement of work items — which are often images — within a company. Spalding used software from Keyfile Corp. in Nashua, N.H., that runs on Windows desktops. It allows users to access image files stored in electronic file cabinets.

The goal of the system slowly evolved from being a departmental specification repository to reducing paper companywide to managing workflow, Brooks said.

"You can't do the workflow when you are buckled down under tons of paper," Brooks said. After employees got used to working with the system to get their paper files on-line as image files, they started asking about redesigning various work processes throughout the company, he added.

For example, employees helped redesign a process that helps generate an internal code number required to ship goods from the factories.

Previously, Brooks said, it took a lot of scrambling within various departments to get the information for the code, causing delays in product shipping. Now, a commodity code workflow



Spalding Sports' Harry Brooks says after using an image management system to cut down on product development time, the company is now looking to reduce paper use and automate work processes companywide

is started the same time a new product spec is created, and the code is ready when the product is set to hit the streets.

Deciding how other processes should be automated has employees with similar functions jockeying for different degrees of participation in the process. "The technical difficulties

Spalding, page 62

Sun gives high-end Unix servers a boost

By Jean S. Bozman

Sun Microsystems, Inc. is boosting the wattage on its high-end Unix servers this month, adding faster chips and allowing onboard processors to grab more memory as they need it. Systems performance for the servers will improve up to 40%, the company said.

Sun's latest batch of Unix servers run on 85-MHz SuperSPARC RISC chips under a Solaris 2.4 Unix operating system. The units will replace servers based on 60-MHz RISC chips that have lagged in performance for several years compared with rival RISC chips, analysts said.

Although Sun's workstation users had been able to upgrade their 60-MHz chips by swapping in faster hyperSPARC chips from Ross Technologies, Inc. in Austin, Texas, the Ross chips didn't work with Sun servers, Sun said.

Upgrades needed

Users said the processor upgrades — priced at \$5,000 per CPU for older SPARCserver 1000E machines and \$9,995 per CPU for SPARCcenter 2000E machines — are welcome improve-

ments. "It sounds like a good option for us," said one West Coast user who asked not to be identified.

Base prices for the SPARCserver 1000E units are \$50,100 to \$126,050; the SPARCcenter 2000Es range from \$125,395 to \$678,595. The servers are set to ship this month. Sun cut prices on its 1000E servers up to 23% this summer.

The servers provide more paths between cache memory and main memory. This is designed to boost database performance. But several users said their main upgrade needs involve disk I/O speeds for their 1000E servers accessing databases rather than more processor

capacity.

Some users plan to use the new hardware right away. "We're expecting a significant performance improvement," said Geoff Ridden, decision-support systems manager at BC Telecom, Inc. in Vancouver, Canada, who has ordered a 14-processor SPARCcenter 2000E.

Moving ahead

BC Telecom developed a data warehouse using a smaller SPARCserver 1000 with eight processors and Oracle Corp. 7.x databases. After learning of the faster processors several weeks ago, the site was able to rewrite its lease to include

new chips for the 14-CPU production machine. Ridden said that with installation due this month, "our timing was good."

Others plan to wait. "If you're not running at or near capacity, there may not be a need to move right away," said Roger Holtom, business technology consultant at Ciba-Geigy Corp.'s Chemicals Division in Greensboro, N.C. "If it would do anything at all for disk I/O, then we would upgrade. But our CPUs usually run at 30% to 50%" of capacity, he said. His site has four SPARCserver 1000Es running Oracle databases and SAP America, Inc. R/3 manufacturing applications.

The enhanced SPARCserver 1000E and SPARCcenter 2000E servers most likely won't be upgradable to Sun's next-generation processors, the 64-bit UltraSPARC chips, several industry analysts said. UltraSPARC-based servers will have faster system buses and use different cache memory, analysts said.

"They're definitely nearing the end of their life, and there are clearly going to be questions from users about how to upgrade to UltraSPARC servers," said Tony Iams, a research analyst at D. H. Brown Associates, Inc. in Port Chester, N.Y. He said many users are realizing that their next high-end Sun server upgrade may involve buying a whole new system.

Sun's new high-end servers

MODEL	PROCESSORS	BUS	MAIN MEMORY	STORAGE MEMORY	PRICE/AVAILABILITY
SPARCserver 1000E	2 to 8 85-MHz SuperSPARC II RISC chips	3 to 12 Sbus slots	Up to 2G bytes	Up to 760G bytes	\$50,100 to \$126,050/ This month
SPARCcenter 2000E	2 to 30 85-MHz SuperSPARC II RISC chips	4 to 40 Sbus slots	Up to 5G bytes	Up to 4.86T bytes	\$125,395 to \$678,595/ This month

After a decade of breaking down functional barriers in companies, why do we continue to keep structured and unstructured information apart? Relational databases are stuffed with structured information that is hard for non-technical business professionals, such as salespeople and managers, to access and use. Yet, unstructured information stored in e-mail messages, faxes, spreadsheets and word processing documents is an equally valuable source of corporate knowledge.

As demand for more strategic use of information grows, IT departments must respond with new business applications that unify structured and unstructured information and make it available for day-to-day business use.

Until now, the challenge has been how to leverage information in relational database management systems (RDBMSs) for a wide range of client/server applications. Recently, the rules have changed again. Today's critical applications must meet even tougher requirements: sophisticated workflow processing, enterprise-wide connectivity to customers and suppliers, and support of increasingly mobile users. The sticking point is that transaction-oriented applications are frequently difficult to enhance and modify, and are not architecturally designed to support these new application requirements.

Groupware has emerged as a technology that complements the strengths of RDBMSs. Most people know that groupware is designed to manage and distribute documents anywhere in the enterprise, but far fewer are aware that groupware can give users access to both structured and semi-structured information, regardless of location or computing platform.

To integrate effectively with RDBMSs, a groupware product must:

- Offer a variety of straightforward database connectivity options

- Provide robust support of distributed workgroups and mobile users
- Enable workflow automation to move information through a business process.

Lotus Notes: A Hub, Not An Island

Lotus Notes® is the tool of choice for building high-return applications that

Integrating Groupware and Relational Database Systems.

leverage relational and non-relational information. With a variety of data integration products to choose from, developers can now extend groupware applications to include relational data. For many business professionals, Notes' easy and intuitive user interface becomes the central launchpad to a universe of vital business information. For developers, there are flexible options for integrating data at the application level or even at the server-to-server or transaction level.

Notes™ supports access to the leading RDBMSs. And because Notes runs on all popular computing platforms and supports the leading APIs, you can quickly build applications to distribute and update

information — even application design updates — wherever it's needed.

The Payoff: World-Class Applications

Now applications can pull human resource information from transaction systems into Notes-based applications that automate the entire hiring process, from searching for candidates with specific experience to making job offers.

Companies can more effectively win competitive bids by quickly generating accurate and complete proposals integrating the latest cost information from transaction systems with the rich document authoring capabilities of Notes.

In hundreds of sales organizations, Notes fosters "virtual" team selling by coordinating the latest information gathered from such disparate sources as call reports, real-time news feeds and financial transaction data. Salespeople can continuously and securely update colleagues anywhere in the world with the latest customer or competitive information.

Field-based work crews can be managed more effectively when work order transactions are distributed via Notes. As jobs are completed, crews replicate updated information back to headquarters.

The technology may be sophisticated, but the point is simple: anywhere structured and unstructured information must come together to create business value and support critical decisions, there's only one groupware product that combines the ability to communicate, collaborate and coordinate with efficient, reliable RDBMS integration. **Lotus Notes.**

Lotus
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Stratus Computer turns on Radio, a fault-tolerant server

By Michael Goldberg

Stratus Computer, Inc.'s new PC server offers PC LAN users fault-tolerant options in a neat package. But the Radio server — a departure from its history of providing high-end, fail-safe computers for transaction processing — also prompts questions about Stratus' ability to generate any momentum in an already teeming field.

Unveiled last week, the Stratus Radio server is billed as "a PC cluster in a box." It uses commodity components such as Intel Corp. Pentium processors in a cabinet with eight nodes for networking, computing and disk storage [CW, July 17].

Radio, which stands for Reli-

able Architecture for Distributed I/O, will run on Microsoft Corp.'s Windows NT operating system and SCO, Inc.'s UnixWare, which SCO recently bought from Novell, Inc. Stratus officials said users can attach up to four Radio boxes together into one cluster.

Bringing it together

Radio incorporates software from Isis Distributed Systems, Inc., a Stratus subsidiary, to detect hardware and software failures in the system and users' applications. The software can direct recovery and restart applications on another node in the system while notifying users of a systems flaw if a user selects these options.

Fault tolerance

Stratus is selling Radio directly and through resellers.

Users and analysts praised Stratus' design, especially its use of PC-familiar ingredients and a dedicated pair of network connections, which provide a backup connection for compute and storage nodes.

At the same time, observers said Stratus is entering an unfamiliar field dominated by server vendors such as Compaq Computer Corp. and Hewlett-Packard Co. Stratus in Marlboro, Mass., is likely to have an uphill fight in winning customers outside of its traditional base, said Jon Oltsik, an analyst at Forrester Research, Inc. in Cambridge, Mass. "They're really an unknown player."

But for Stratus users moving to more PC-based applications,

Radio comes as exciting news.

At New York-based brokerage house PaineWebber, Inc., Danny

A look inside

Radio, Stratus' new eight-drawer PC LAN server, offers these features

Computer nodes:

Two, three or four, each with dual 133-MHz Pentium processors

Storage nodes:

Two, three or four, each with 100-MHz Pentiums and 2G-byte drives

Networking nodes:

Two, each with 100M-bit Ethernet hub or switch

Operating systems supported:

SCO's UnixWare; Microsoft's Windows NT Server available next month

Price range:

\$63,000 to \$110,000

Gumport, senior vice president and director of distributed systems management, said he plans to install Windows NT-based Radio servers in some of his firm's 350 branch offices. Many of PaineWebber's 13,000 PC users are pushing the limits of Windows 3.1, and Radio with NT would give them a fault-tolerant application server with a familiar feel, Gumport said.

Initially concerned about support for Radio, Gumport said he was relieved when Stratus offered its traditional method of monitoring customers' systems and alerting them of failures.

Larry Friedman, vice president of financial services at Price Chopper, Inc. in Schenectady, N.Y., said his supermarket chain will use a cluster of UnixWare-based Radios to develop marketing and decision-support applications from data it collects from customer transactions. "The big thing with Radio is that it's a way to do [fault-tolerance] cost-effectively with standard PCs and software," he said.

Firm introduces router to link remote offices

By Laura DiDio

Compatible Systems, Inc. in Boulder, Colo., recently introduced a low-cost, wide-area router that lets small and medium-size businesses consolidate remote-office traffic into corporate headquarters.

The new RISC Router 3800R lets businesses link up to 12 remote offices to the central office at speeds up to 256K bit/sec. The RISC Router 3800R is a flexible device that lets businesses consolidate their wide-area network (WAN) traffic and mix and match routing connections that work best for individual offices.

Wide-area links

Users such as David Yacawych and Jerry Hammond, programmers and systems analysts at Mendicino County Schools in Ukiah, Calif., said they are interested in the RISC Router 3800R. It will allow them to create WAN links among the county's 15 district offices and eventually the 50 schools in the district using standard voice, leased and switched 56K bit/sec. or Integrated Services Digital Network lines.

Hammond said Mendicino County currently has Compatible Systems' 3400R RISC Router and is pleased with the device's reliability and ease of use.

"We especially like the fact that the routers are software configurable from within Windows, so it's much simpler and less time-consuming to configure

Vital statistics

Company: Compatible Systems, Inc.
Product: RISC Router 3800R
Features: Consolidates remote-office LAN traffic at the central office
Price: \$3,495
Shipping: Now

than many other routers," Hammond said.

Additionally, the RISC Router 3800R routes all industry-standard networking protocols, including TCP/IP, Novell, Inc.'s IPX, Apple Computer, Inc.'s AppleTalk and Digital Equipment Corp.'s DECnet.

All of the ports are independently configurable and support both synchronous and asynchronous data transmission using either Point-to-Point Protocol or frame-relay, wide-area transport protocols, according to Tom Ferrell, product manager at Compatible Systems.

Eric Hindin, a senior network analyst at The Yankee Group, a Boston-based consultancy, said Compatible Systems gives users a "wide variety of connectivity options, depending on the needs of their various remote offices."

Compatible Systems has "also priced its router line very aggressively, and they provide users with free software upgrades, which is another big cost savings," Hindin added.

The RISC Router 3800R is available now.

Legato unveils NT version of NetWorker backup software

By Steve Moore

Vendors are beginning to provide consistent ways to handle critical systems management functions across mixed Unix/NT networks. Legato Systems, Inc. in Palo Alto, Calif., for example, recently introduced a Microsoft Corp. Windows NT version of its NetWorker multiplatform backup application.

Analysts hailed Legato's NetWorker for NT. "It allows you to sit on NT and back up Unix or sit on Unix and back up NT," said Mike Peterson, president of Strategic Research Corp. in Santa Barbara, Calif. Other available products let users back up NT clients from Unix servers but not vice versa, he said.

Spice of variety

Also appealing, users said, is the product's support of a broad range of client/server platforms, including NT, OS/2, Macintosh and most Unix variants.

At the Department of Natural Resources for the Canadian Forest Service's Pacific and Yukon region, NetWorker is used to back up NT along with Unix machines from Silicon Graphics, Inc., Sun Microsystems, Inc. and Digital Equipment Corp.

"We haven't seen anyone demonstrate this much cross-platform [backup] support, even across all Unix platforms," said Guy Gondor, chief of informatics at the Canadian government research agency. "NetWorker is supporting [Digital's] Pathworks Version 6.0, which was

just announced but is not available to us yet," he said. "The only thing they don't do well is the technical documentation," which isn't well organized and lacks enough detail, he added.

Centralized backup such as that provided by NetWorker "is very cost-effective" when used to support "a reasonably large group of people," said Ilia Levi, a systems analyst at Eastman Kodak Co. in Rochester, N.Y.

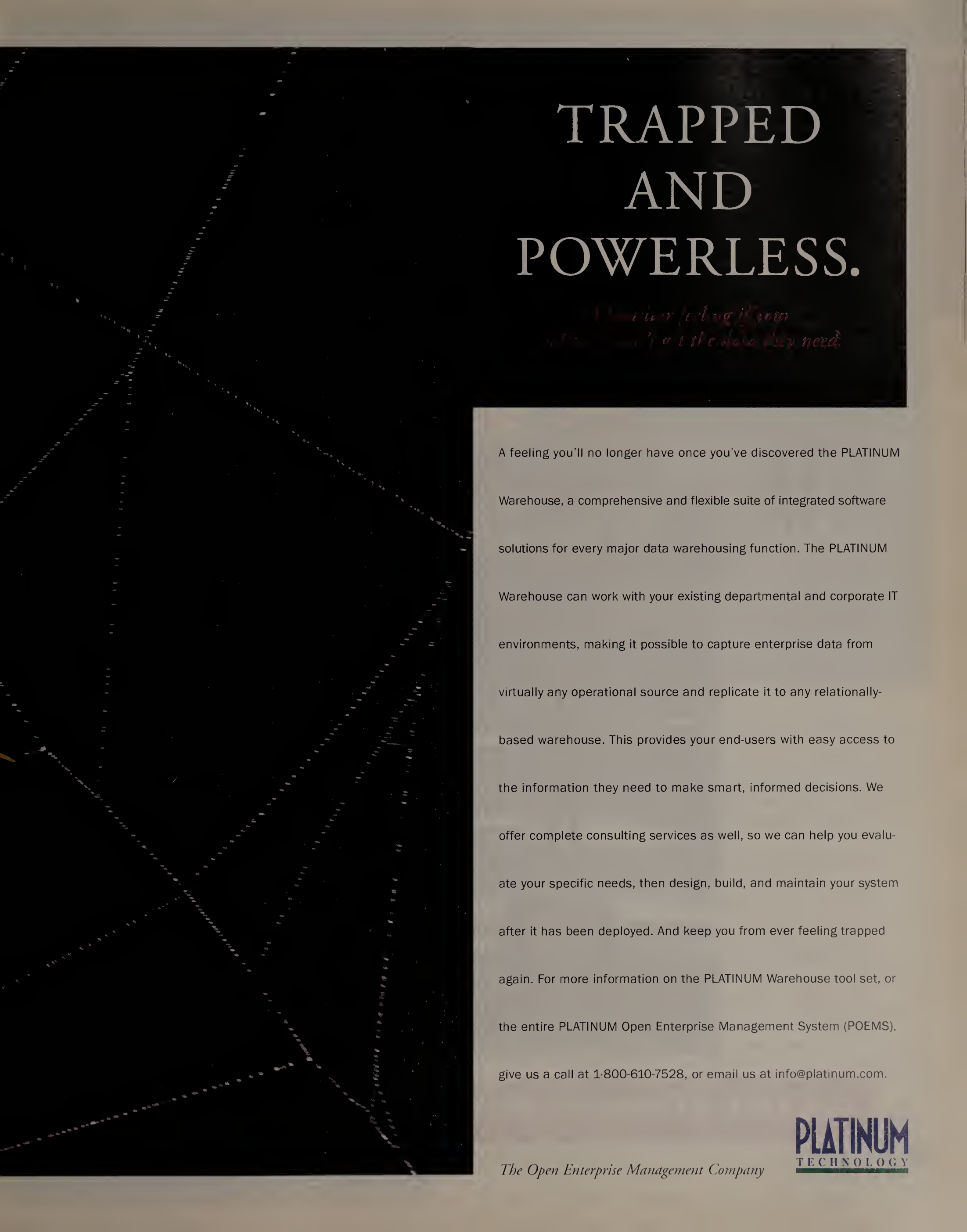
Kodak must back up 60 mixed Unix workstations as well as more than twice that many Windows 3.1 and Macintosh machines, he said.

Legato's Macintosh support will be valuable for the University of California's San Francisco facilities, where 2,000 Macintoshes are used along with Unix, NT and Novell, Inc. NetWare servers, said Joseph Silverton, a systems analyst at the school. With Legato's centralized backup software and Macintosh support, "We don't have to buy dedicated Maes or tape drives," he said.

"We haven't seen anyone demonstrate this much cross-platform [backup] support, even across all Unix platforms."

— Guy Gondor,
Canadian government
research agency





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TECHNOLOGY

Percussion offers 'Live' performance for Notes

By Tim Ouellette

Percussion Software made a lot of noise recently with its introduction of Notrix Composer Live.

The Notes-compatible software promises real-time access to relational database information from a Notes client.

This feature promises to leapfrog Lotus Development Corp.'s NotesPump, announced earlier this month. NotesPump and similar products copy information from relational databases down to Notes databases, then attempt to resynchronize the data when they return it to relational databases.

"You might get data that might be out of date with replication," said Glenda Smith Morgan, a senior computer analyst at Day & Zimmerman Information Solutions, Inc. in Radner, Pa. "When a customer calls for account information, you want up-to-date information from the database."

Notrix Composer Live runs on Microsoft Corp.'s Windows NT or OS/2 servers. Users fill out a Notrix form to link Notes to the database and retrieve the designated fields in Notes.

Data integration

Morgan added that with Notes on every desktop at Day & Zimmerman, it helps to have direct access to relational database information from one front end. The company currently uses Percussion's Notrix Composer, which works much like NotesPump does.

There are two problems with database replication, said Audrey Augin, vice president of marketing at Stoneham, Mass.-based Percussion. Data brought into Notes may change when it is copied back to the relational database, and often, Notes databases become full of information that doesn't need to be there.

"You don't have to duplicate your relational database into the Notes database," Morgan said. "You might only keep current things in the Notes database if you wanted immediate access."

Notrix Composer Live costs \$7,500 and comes with Object Database Connectivity, flat-file interfaces and a Notes-to-Notes transfer utility. Direct database drives for IBM's DB2/2, Oracle Corp.'s Oracle7 and Microsoft's and Sybase, Inc.'s SQL Server cost \$3,750 each.

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Spalding

CONTINUED FROM PAGE 57

ties are minimal, it is the political issues you have to deal with," Brooks said.

While Spalding is well known in the industry, it isn't such a major player that it could afford to buy a high-end, high-volume imaging system that requires lots of integration and training. That is why it went with the lower-cost, easy-to-install Keyfile system, Brooks said.

Parrot said it takes him about 45 minutes to familiarize users with the software and how to use the system to view specs.

Making it work

It can be a challenge to get users to integrate Keyfile into their normal work routine. But IS gets help from the specifications office, which used to print, copy and mail out each new change. Brooks said the office will let employees ask for a copy of a spec only once. After that, employees must retrieve all product specs from the Keyfile system.

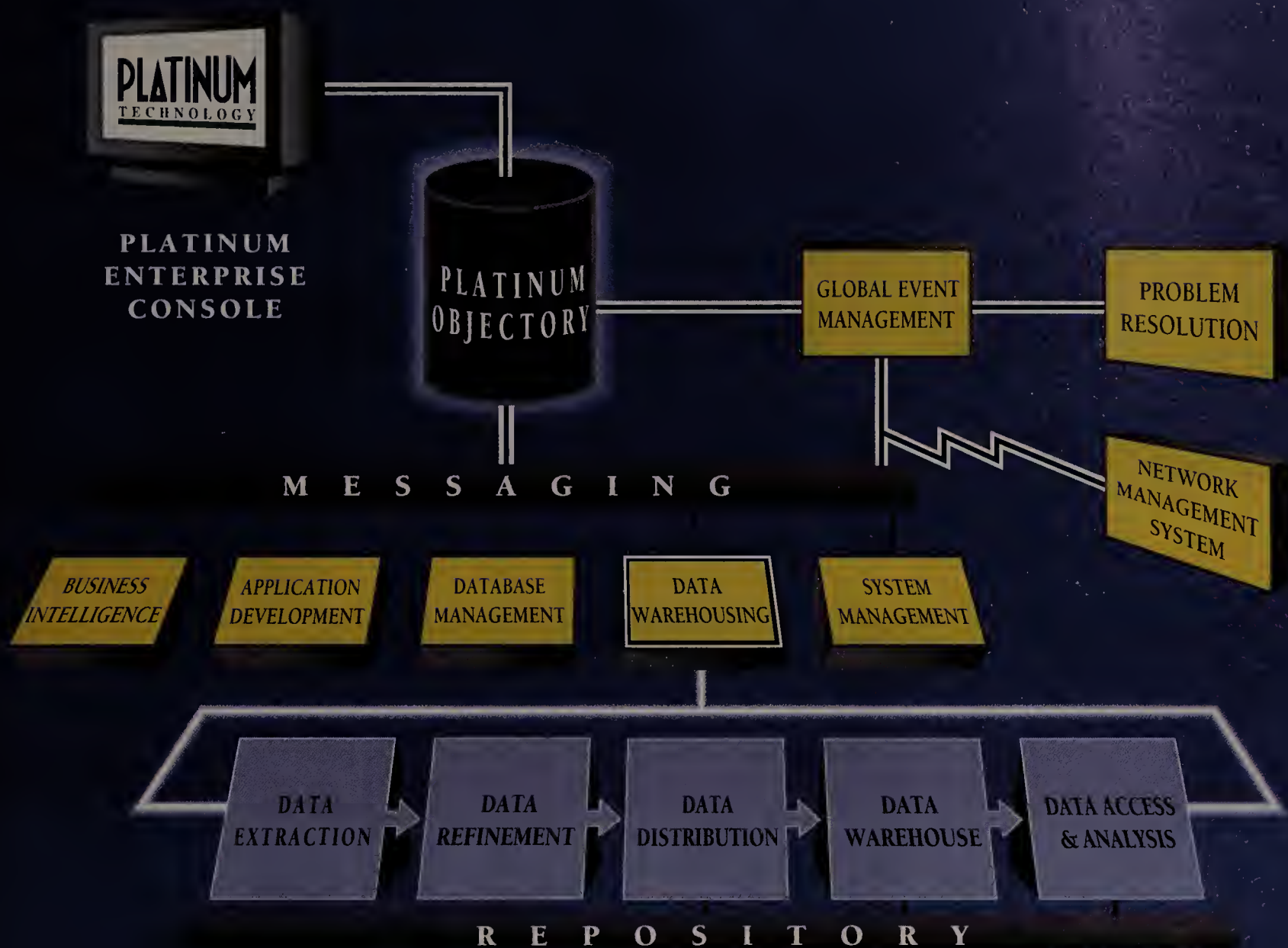
There are currently 180 users of the Keyfile system and some walk-up terminals for factory workers. During the next year, about 250 more employees will be linked to the system, Brooks said.

Product specs reside on a Keyfile OS/2 server, while a Unix server handles other imaging needs and workflow at the firm. Users need to log on separately to each server, but Spalding plans to install the next version of Keyfile, which promises to integrate the Unix and OS/2 servers.

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New Products

Vcon, Inc. has introduced the Armada Cruiser 100 System, a desktop videoconferencing system.

According to the Dallas company, the Armada Cruiser 100 System provides video at rates up to 24 frame/sec. over Basic Rate Interface Integrated Services

Digital Network lines. It was designed for applications requiring one- or two-way full-motion video with audio.

The product includes a Peripheral Component Interconnect-based hardware board, a camera, an audio handset and user software. It can support data rates from 64K to 384K bit/sec. Features include file transfer, electronic whiteboarding and real-time application sharing. The product is also standard-compli-

ant and fully interoperable with any H.320 desktop or room system.

Pricing for the Armada Cruiser 100 System starts at \$1,595.

► *Vcon*
(214) 774-3890

Emulex Corp. has introduced Net Wizard Printer Server Administrator.

According to the Costa Mesa, Calif., company, Net Wizard Printer Server

Administrator gives network managers a means to control Emulex NetJet and NetQue multiprotocol printer servers. It provides access to management functions through a Windows-based graphical user interface and manages the printer servers through Simple Network Management Protocol over TCP/IP or IPX lines. The product was designed to simplify the configuration procedures for printer servers and printers.

Net Wizard Printer Server Administrator tracks the status of the printer servers and produces statistics on servers and ports for network planning and management.

Pricing for Net Wizard Printer Server Administrator starts at \$25.

► *Emulex*
(714) 662-5600

Pitney Bowes, Inc. has introduced the Model 9610 multifunctional workgroup fax/printer.

According to the Stratford, Conn., company, the Model 9610 is a plain-paper fax unit that connects to a PC to print laser documents at 8 page/min. It can also scan documents and include logos and graphics.

The product complies with Energy Star standards and saves energy by resting between transmissions.

The Model 9610 fax/printer costs \$3,995. It can be rented for \$139 per month.

► *Pitney Bowes*
(203) 381-7000

Keyfile Corp. has announced Keyfile Document Server, a document management and workflow product for Microsoft Corp.'s Windows NT.

According to the Nashua, N.H., company, Keyfile software lets users electronically handle every office document — both paper and electronic — by providing a tool for filing, retrieving, sharing, distributing and automating document management. It uses object-oriented technology and a drag-and-drop graphical workflow interface.

License pricing for Keyfile Document Server starts at \$7,995. Client software is priced separately and starts at \$795.

► *Keyfile*
(603) 883-3800

Specom Technologies Corp. has introduced VisionTime Pro, a videoconferencing product.

According to the Santa Clara, Calif., company, VisionTime Pro is a Windows-based whiteboard application that lets two users exchange video, graphics and text data. Video graphics image data can be captured or loaded from a disk and placed on the sending whiteboard and then viewed on the receiving whiteboard. VisionTime Pro requires a modem-equipped PC to support document conferencing over regular telephone lines, digital telephone lines, networks and the Internet.

Pricing for VisionTime Pro starts at \$49.

► *Specom Technologies*
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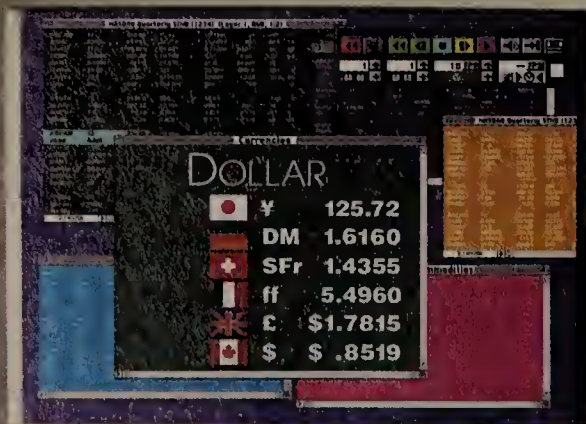
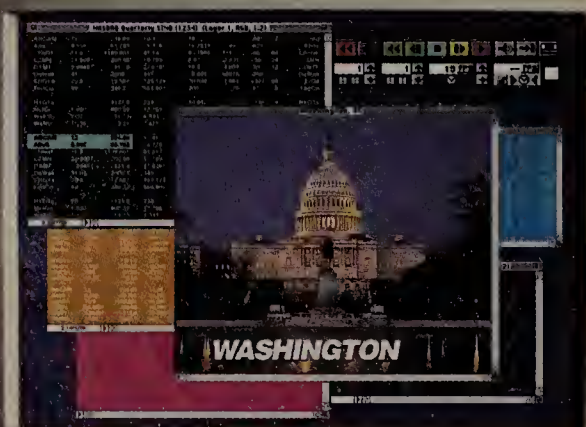
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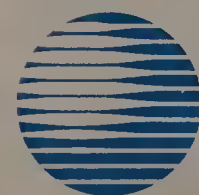
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ARIES shoots for the stars

Project to transmit live data from ship to satellite to ATM network

By Neal Weinberg

With two successful demonstrations under their belts, members of the ARIES project — the broadest Asynchronous Transfer Mode (ATM) test bed — are planning a live transmission from a ship at sea in February.

In a brief demonstration last month in Cleveland and a longer one two weeks ago in Houston, simulated seismic data was sent at 155M bit/sec. from a ground station to a satellite and back to a ground-based ATM network.

The success of those efforts has buoyed members of the ARIES team — a collaboration that includes NASA, the American Petroleum Institute, several oil companies, ATM equipment vendors, local and long-distance carriers and academic institutions. ARIES stands for ATM Research and Industrial Enterprise Study.

The demonstrations prove that ATM is possible for these types of real-time collaborations, according to Larry Flournoy, Texas A&M University's ARIES representative.



munications Technology Satellite, the ATM switches and other hardware provided by vendors and the academic supercomputers used to crunch the data, the network contains an estimated \$1 billion worth of equipment.

"Collaboration is the key," Flournoy said.

Despite the huge costs involved, Flournoy said the major

hurdle to overcome is "people mechanics," such as getting competing vendors to work together.

The ARIES project is already drawing interest from outside the oil industry. Flournoy said Texas Medical Center, a teaching hospital in Houston, plans to do a demonstration next month that will send X rays from Houston to a medical convention in Chicago with ATM.

Flournoy pointed out that X rays sent from the hospital to a remote site currently take an entire night to download.

From the carrier point of view, ARIES is a learning experience and an exercise in cooperation among competing companies, said Daniel Serhsen, ATM market manager at Sprint Corp. in Kansas City, Kan.

ARIES' rollout

September 1995

18-minute demonstration that sent seismic data from Colorado to Ohio to Texas via ATM.

October 1995

40-minute demonstration that sent seismic data from Colorado to Ohio to Texas via ATM.

November 1995

Demonstration to send medical X rays from Texas to Chicago in real time.

February 1996

Demonstration to send seismic data live from a ship in the Gulf of Mexico

Now a reality

David Beering, the project director and a staff telecommunications analyst at Amoco Corp. in Chicago, said that 15 months ago ARIES was nothing more than a concept. Today, there is a network up and running. "We're moving at Mach 5," he said.

ARIES team members plan to transmit live seismic data from a ship in the Gulf of Mexico to NASA's satellite and then to the land-based ATM network, where scientists will analyze data from the ocean floor.

For oil companies, this could mean a huge advance in oil exploration. Currently, specially equipped ships gather data on magnetic tape, which is then carted ashore and analyzed over several months.

"This is a beautiful opportunity for information technology to change an industry," Beering said.

Participants said the project is simply too massive for any one company to undertake.

With NASA's Advanced Com-

Voice over ATM faces several key obstacles

By Bob Wallace

Although adding voice traffic to the blend of data and video would help users more easily justify Asynchronous Transfer Mode (ATM) services, it will be years until voice over ATM lures users away from existing and interim solutions.

That gloomy forecast is built on a solid technological and financial foundation. There are no standards for voice over ATM, extra equipment will be needed, and public ATM services require very high-speed access lines.

Wait and see

Today, only the largest corporations can justify the cost of ATM, and that is because they have super high-end data applications that eat up bandwidth. Adding voice traffic to the mix would make ATM available to a broader user base.

But users shouldn't hold their breath. "It could be a few years before users run voice over public ATM networks," said Daniel Briere, president of TeleChoice, Inc., a Verona, N.J., consultancy that tracks telephone company networks. "There are too many obstacles, such as service avail-

ability and cost, not to mention cheaper proven alternatives."

In the meantime, most users send voice over virtual voice network services, such as AT&T Corp.'s Software-Defined Network (SDN) service. The service has been carrying voice calls for less than 10 cents a minute for years. Users need only an access connection.

Cheap and easy

AT&T's SDN and competing offerings were designed in the late 1980s to lure users away from private voice networks to the telephone companies' public networks, which are inexpensive and don't require users to act as telephone companies.

And virtual voice network rates are already low. "If you don't include the cost of dedicated access lines, the cost per minute of a voice call is about 6 cents, and that doesn't include discounts," Briere said.

But some users are still looking to go one better.

"We've got a 730-site SDN, and we're still taking a serious look at voice over frame relay," said Dan Gonos, telecommunications manager at Domino's Pizza in Ann Arbor, Mich.

Gonos said he will "likely take a look at running voice over ATM when ATM becomes a reality, which could be a few years."

But users and analysts see voice over frame relay as an interim solution to voice over ATM for medium to low voice traffic.

Today, users need large access pipes to tap in to a public ATM service. They could defray the cost of the connection by using it to share multiple voice and data services simultaneously. All major national carriers should support 1.544M bit/sec. access by the end of the year.

The Microsoft Network

Like any newborn, MSN has a lot of potential, but it needs to learn to walk

PROS

- Easy-to-use interface
- Tight integration with Windows 95
- Seamless OLE drag-and-drop operations across applications

CONS

- Limited content
- Heavily advertiser-oriented
- Sluggish, with access speed of 14.4K bit/sec.
- Currently single-user

COST: \$4.95 per month or \$49.95 annually (includes access fees)

The Microsoft Network not yet a contender

By Howard Millman

The Microsoft Network (MSN) does some spiffy things with graphics and has the basic foundation of what it needs to succeed in the market. But right now, it is more of a billboard than a bulletin board.

MSN's main drawback is its lack of content. And in on-line services, content rules. At the moment, MSN's offerings are overshadowed by the encyclopedic offerings found on America Online and CompuServe. While most content targets

Review

MSN, page 74

ATM hurdles

Obstacles to running voice over ATM networks

- Virtual voice networks are cheaper than ATM
- Lack of equipment to pass voice from telephone systems to ATM switches
- Frame relay supports voice
- Carriers focus on data and video over ATM
- Accessing ATM service requires high-speed, expensive T3 access lines
- No standards available

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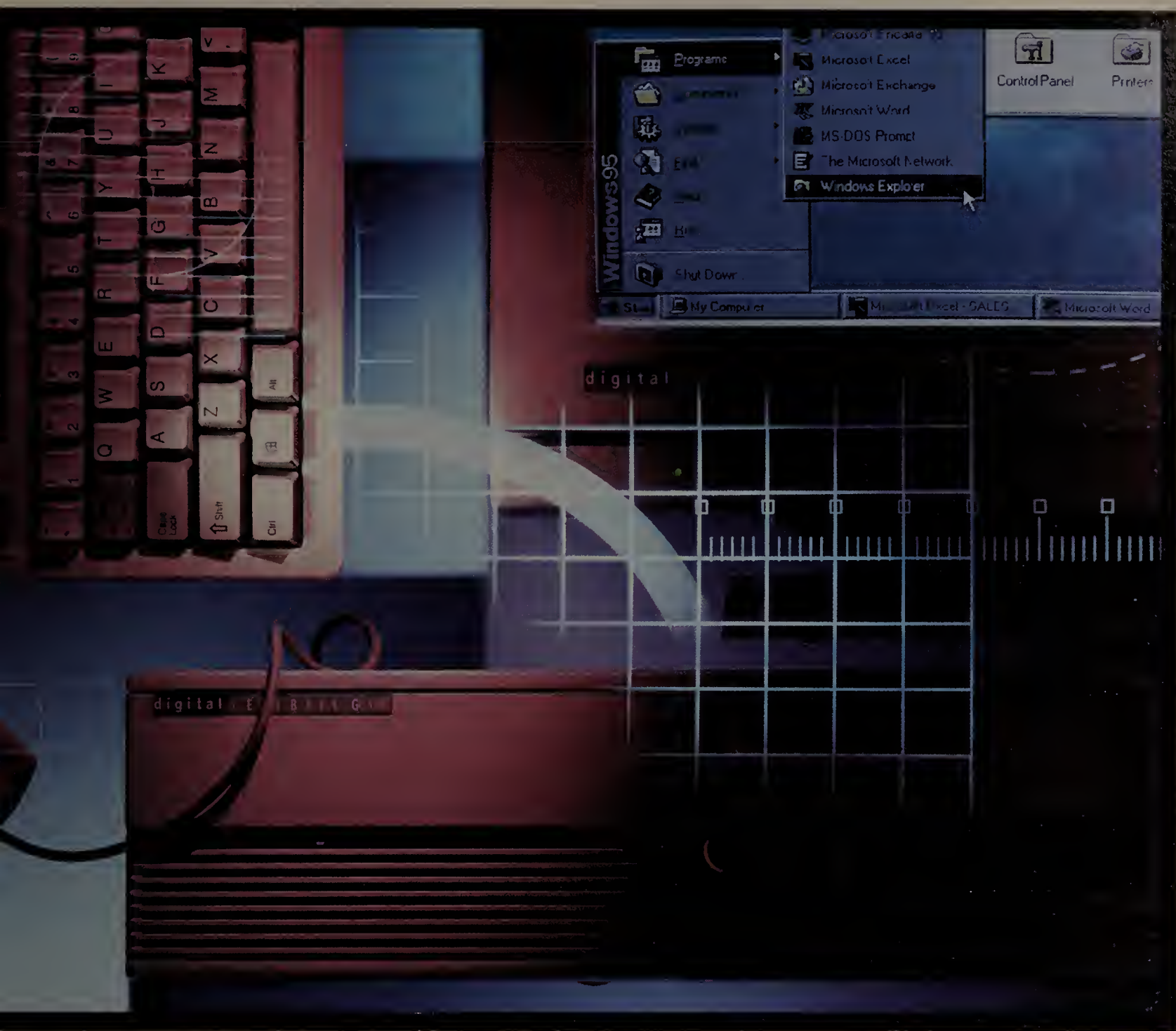
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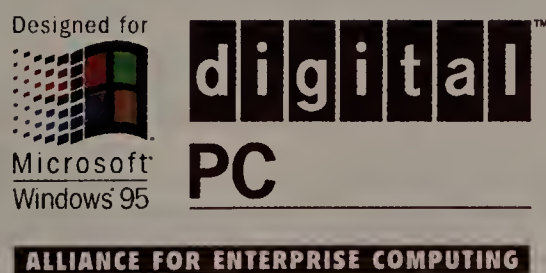
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ALLIANCE FOR ENTERPRISE COMPUTING

Telnet users warned of hazards

If public access isn't secure, users could break into restricted areas

By Gary H. Anthes

Libraries and other institutions that throw open their digital doors to the public run the risk of letting in troublemakers, according to security experts.

The Computer Incident Advisory Capability (CIAC) team at Lawrence Livermore National Laboratory in Livermore, Calif., recently issued an advisory warning about using Telnet to give library patrons Internet access to card catalogs and other library databases.

If the version of Telnet offered to the public isn't carefully stripped of unneeded features, it may offer a path for users to surreptitiously move into private sys-

Do's and don'ts	
Some things to be aware of when offering public access to your system via Telnet or the World Wide Web	
Do	Don't
Keep it simple and give users the minimum capabilities necessary.	Put your server between your firewall and internal network.
Use a Telnet client modified to block users from entering the command prompt.	Put any confidential information on your server.
Install all operating system and Web server patches supplied by vendors.	Use a "fully functional" Telnet client.
Run your server in restricted file space and set it up in "unprivileged" mode.	Use the "include files" features.

Source: Infovision International, Falls Church, Va., and Lawrence Livermore National Laboratory, Livermore, Calif.

tems at the library or other libraries linked together, the CIAC said.

Corporations allowing entry into their systems via Telnet or World Wide Web

browsers are also exposed, experts said.

Libraries try to set up public Telnet access in a way that limits outside access to a few services, said Marvin Christensen, a computer scientist on the CIAC team. "The vulnerability is that if the system administrator doesn't set up the connections correctly, the person coming in from the public can get out [of the restricted area] and do nonrestricted services," he said.

The problem is caused by the nature of libraries: They exist to make information easily available to the public but must carefully guard other data.

Companies have problems, too

Corporations trying to guard access to data face similar issues.

Unless the corporate Web server is carefully set up, with all appropriate security features in place, users could break out of the public space on the server to retrieve password files, install password or credit-card "sniffers" or jump to other systems, said John Pescatore, an information security analyst at Infovision International in Falls Church, Va.

"Libraries have long had concerns about the privacy of their circulation records," said Susan Anthes, associate director for public services at the University of Colorado in Boulder. "They have even stopped the FBI from looking at who's checked out books on building a bomb."

Libraries must be careful also to honor contractual agreements that limit access to proprietary databases provided by information vendors, Anthes said.

She said the university library hasn't suffered from the Telnet problem addressed in the CIAC advisory, but a student was able to break into a system and delete library fines for some friends.

Christensen said he recently helped a library, which he declined to name, track an intruder through a chain of five libraries linked via the Internet. The intruder was able to change system variables at each library to disguise his identity. Protected by this anonymity, he posted a large volume of offensive material to an Internet newsgroup.

Hello, operator?

Telephoning over the Internet could be cheaper than Ma Bell

By Kim S. Nash

Watch out, AT&T.

A few companies are trying to bring long-distance telephone-like calls to the Internet. The results could save business and home users a bundle when compared with traditional phone rates.

Users of PCs outfitted with multimedia gear would be able to talk to one another over the Internet, wherever they may be, for the price of a local call to an Internet service provider.

As long as they have an Internet account, PC, sound board, microphone and modem, everyone from college kids calling home to talk to mom to companies with units overseas could cut the amount they would otherwise pay to AT&T Corp., MCI Communications Corp. or Sprint Corp. for traditional long-distance calls.

"That would really be something," said Jerry Mariani, a manager at a large regional Bell operating company.

Mariani noted that although his firm might see this technology as a threat, he personally would like to see it come to fruition.

Taking on the big guys

Indeed, several small companies want to provide technology to help users end-run the giant long-distance carriers.

VocalTec, Inc. in Northvale, N.J., recently unveiled Internet Wave, an audio communications package for Microsoft Corp.'s Windows 3.1 and Windows 95. The product lets users hear real-time audio signals from other users also running

Internet Wave or listen to prerecorded material. A free trial version of Internet Wave can be downloaded from the World Wide Web at <http://www.vocaltec.com>.

International Discount Telecommunications, an access service based in Hackensack, N.J., filed a patent for similar technology late last month.

Most initial Internet calling products will be half-duplex, similar to citizens band radio, an International Discount spokesman said. With this technology, only one party at a time can speak, or broadcast, during a conversation.

PC + Internet = telephone

While voice-to-voice Internet telephone service may be a few years away, the worldwide network is getting more audible

- RealAudio from Seattle-based Progressive Networks lets users with multimedia PCs peruse and play snippets of sound found on the Internet. This free software can be downloaded at <http://www.realaudio.com>.
- Quarterdeck invested \$1.5 million late last month in Lernout & Hauspie Speech Products in Woburn, Mass., to help speed development of Quarterdeck's forthcoming WebPhone product.
- Cambridge, Mass.-based Bolt Beranek and Newman seeks to combine audio with video in its T/40 router for videoconferencing over the Internet. The T/40 router, which recently entered beta testing, is aimed at users who want to avoid buying and maintaining separate videoconferencing gear.

http:

Data warehouse whereabouts

Beginning data warehouse managers may want to turn to the World Wide Web for a quick electronic education on the topic. Even IS professionals who are well into warehousing projects can pick up a tip or two on extracting data from legacy systems or training end users to use new analysis tools.

HOT SITES

■ Larry Greenfield, a database manager at an independent consultancy in Northfield, Ill., recently created a site chock-full of good warehouse resources. Dubbed the Data Warehousing Information Center, the site is at <http://www.stametinc.com/pwp/larryg/index.html>. It contains links to other warehousing pages as well as pointers to articles and white papers on the topic.

Perhaps most useful, though, are Greenfield's "Personal Rants and Raves" pages. They offer practical tips from someone who has been there and done that, including advice on building a warehouse and common problems to avoid.

■ Spectrum Reports, a market research firm based in the U.K., offers several reports and how-to papers that focus on the basics of building a data warehouse. See http://www.aladdin.co.uk/mw_spectra/collectn/Database.html.

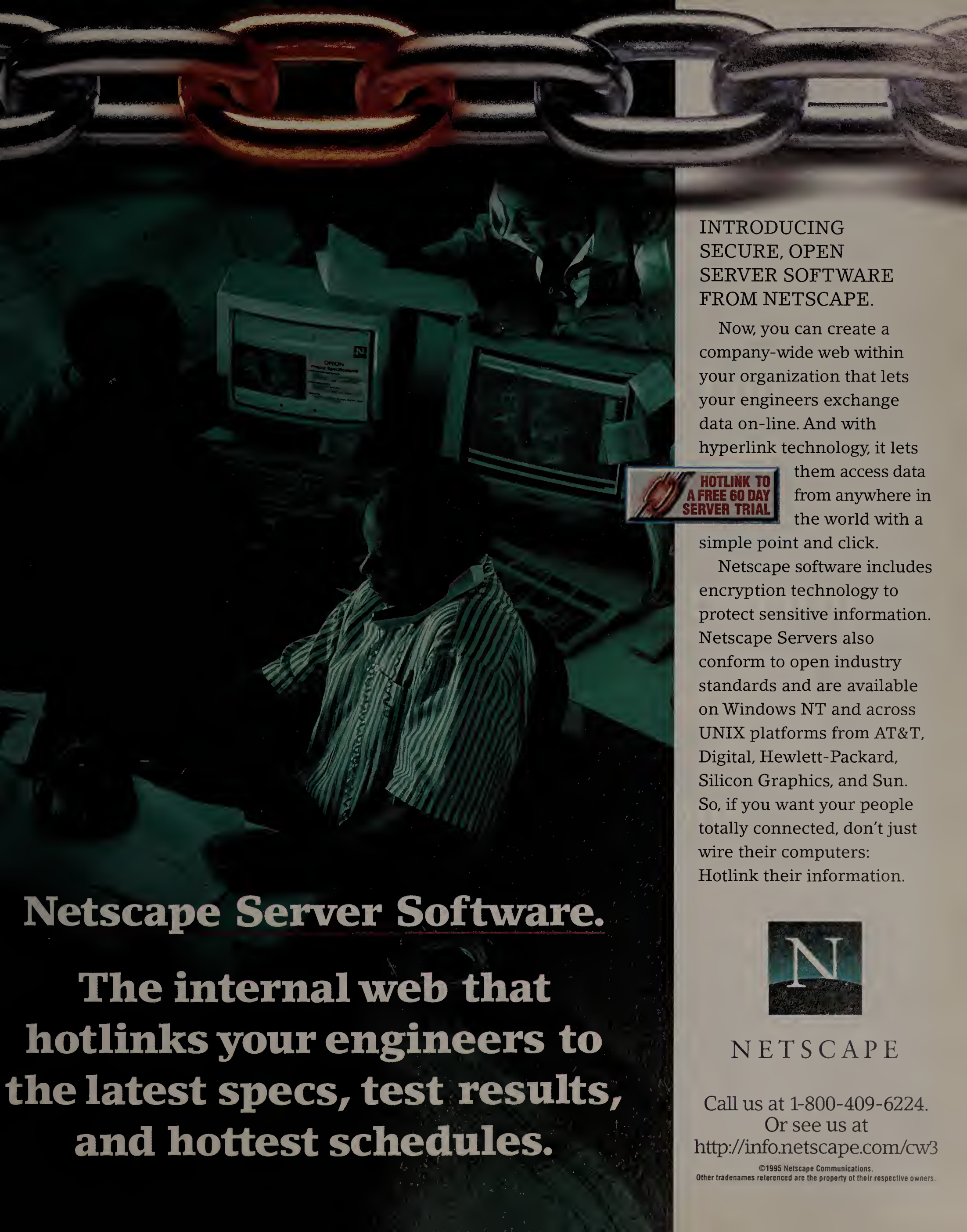
■ Several software and hardware vendors have pages at their Web sites dedicated to warehousing. Most give product descriptions and some customer case studies. SAS Institute, however, has sponsored a site with a detailed "slide show" that explains warehouse architectures, terminology and possible applications. Check out <http://www.uokhsc.edu/home/experimental/slideshow.html>.

— Kim S. Nash

■ **Oops!** Last week in our list of career-advancing Web pages, we left out our own, at <http://careers.computer-world.com>.

Christensen advised against the use of a "fully functional" Telnet client on systems that permit public access. Instead, he said to use a version that has been modified to block users' ability to enter the command prompt, which gives users privileges necessary to escape the restricted environment (see chart).

And firms shouldn't scrimp on set-up costs. "As everyone races to make their services available on the Internet, they overlook the basics. In the long run, they would probably save money if they did it correctly up front," he said.



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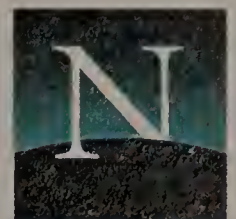
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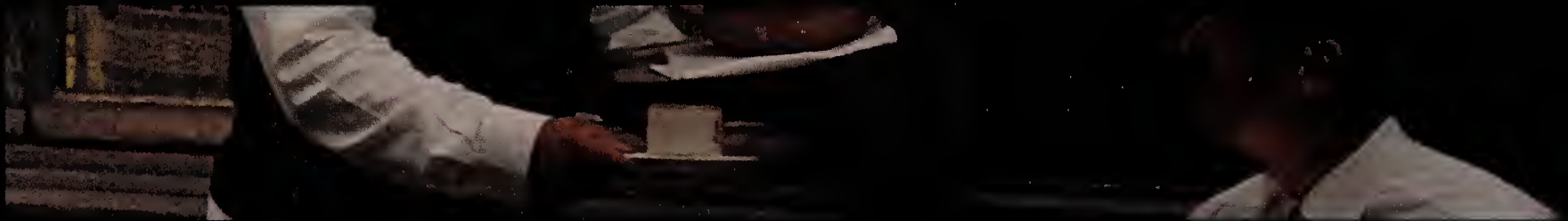
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HP network speeds LAN diagnosis

System lets staff handle problems from their desks

By Patrick Dryden
ATLANTA

Mark Conroy made sure that his support staff would never again have to leave their department to diagnose LAN problems.

Conroy, a telecommunications engineer in Hewlett-Packard Co.'s Corporate Network Services group, took advantage of a data center move to build a new network that makes troubleshooting internal networks vastly easier. Conroy's group provides support for the data center and HP field operations throughout the Western Hemisphere from the new Atlanta Technology Center here.

The system was designed to let support personnel handle network problems from their desks because finding a protocol analyzer and lugging it to the suspect segment took too long, Conroy said.

Applying a protocol analyzer was the last effort to find and fix a problem. That process took 20 to 40 minutes just to locate the tool, followed by the hassle of

dragging it to the caller's LAN, finding a port to plug in to, then attempting to duplicate the problem, said William Pace, an HP information technology specialist.

In the new, streamlined process, a separate management network links every LAN in the data center to a single analyzer run by the 10-person Corporate Network Services group on the 14th floor.

"We do all the troubleshooting from upstairs now," Conroy said. "We can examine traffic and packets on any segment during a call, and nobody has to mess around inside the data center cabinets."

Immediate testing

In the past, network supporters would waste a lot of time on a call without any kind of visibility into the segment, Pace said.

"Now we jump right to the analyzer earlier in the problem resolution cycle, after checking basic configuration," Pace said. "We can test immediately instead of trying to do everything possible beforehand."

Quick analysis eliminates finger-pointing when someone complains that the network is down, Conroy said. And the ability to easily capture transaction packets lets the network support group help evaluate the performance of systems and the impact of new applications.

Separate cable runs and physical-layer switches create a path between a 14th-floor analyzer and any Ethernet segment in the building.

Every HP hub connects to multiport switches from Atlanta-based LAN-hopper Systems, Inc., which connect to other LAN-hoppers in the support group. That configuration prevents blind spots caused by bridging in the data center, where servers on individual segments funnel through ES/1 Ethernet switches from Standard Microsystems Corp. in Hauppauge, N.Y.

Streamlined troubleshooting

When Hewlett-Packard built a new site for its data center and operations, network designers added a separate network to improve management

Problem

Network support staff couldn't diagnose Ethernet segments quickly and easily. They had to haul a protocol analyzer to a user's LAN or a server link in the data center.

Solution

Wire a series of switches that link all hubs back to a protocol analyzer in the network services department. Now staff can establish a connection with any suspect segment to view traffic and capture packets.

From the HP OpenView management console, network supporters run scripts that establish the desired connection through the LAN-hoppers. Then they can view and capture packets on a Sniffer protocol analyzer from Network General Corp. in Menlo Park, Calif.

"Adding some wires and incidental links was worth the cost, so we could respond quickly to problems in the data center and every floor of this new building," Conroy said.

The Microsoft Network

CONTINUED FROM PAGE 67

consumers, the on-line technical forums in CompuServe, for instance, provide excellent value for information systems managers. We found MSN wanting here.

The upstart from Redmond, Wash.-based Microsoft Corp. is gaining momentum, though, as was witnessed in our two trips through the service.

First look

In our first visit to MSN's electronic landscape, we found a Hollywood-type city. We saw the expected assortment of content and services, including electronic mail, chat, file downloads, news, bulletin boards, arts and technology sites. But many sites were still under development, as evidenced by their sparse or even empty databases.

Indeed, some of the operating sites were actually advertisements masquerading as features. For example, most of the computer magazine sites' limited content was designed to elicit subscriptions. This unbridled commercialism extended to other areas. On the plus side, however, the service was pleasing to the eye and easy to use.

Review

Microsoft promised to fill in content gaps and add new services. A second visit one month later showed real progress. We uncovered a variety of new forums, features and incremental content improvements.

As one might expect, Microsoft wants MSN to appeal to consumers. It has also promised features meant to appeal to business users, such as private forums and secure chat centers.

But these won't appear until the first quarter of 1996.

MSN keeps users waiting for content, both in terms of its existence and how long it takes to get to it. The service doesn't support modem traffic faster than 14.4K bit/sec., which we found minimally tolerable for the service's rich graphics.

The modem support may be one factor delaying the amount of content on MSN.

Microsoft officials deny that their competitors offer faster performance but nevertheless plan an upgrade before year's end that they say will significantly improve performance.

Tricks of the trade

In the meantime, Microsoft resorts to some clever tricks to enhance performance. For example, a progressive graphic-rendering technique lets text appear sooner, enabling the user to read the text while the graphics gel. Users can also click out of the site before the graphics fully materialize.

Other time-savers include designating selected sites as "Favorite Places," enabling a single click return; using a "go" command to jump directly to a site (similar functions are available on CompuServe and America Online); and using the "list" display mode for a site, bypass-



The Microsoft Network's basic interface is simple and straightforward

ing the site's graphics and icons.

The best trick of all is increasing MSN's default access speed of 14.4K bit/sec. To get 28.8K bit/sec. modem access you have two choices: You can download a free TCP/IP utility from MSN's Internet Center or purchase Microsoft Plus, a \$49.95 add-on.

Aside from faster access speeds, Microsoft Plus provides goodies such as theme screen-savers, animated icons and desktop management utilities. In addition, Microsoft Plus delivers full Internet access, whereas the MSN version that ships with Windows 95 offers only E-mail, file transfer protocol and newsgroups on the Internet.

Unfortunately, when we added Microsoft Plus, our machine emitted an endless stream of error messages, locked up and, in general, mutined. It took several hours and several minor mir-

acles to solve the problem.

This happened on a Sunday, so when Microsoft's product managers called back on Monday, we had resolved the problem. Microsoft offered to help determine the cause of the problem, but we didn't want to deliberately recreate it.

Microsoft plans to unbundle MSN and Internet access from Windows 95 early next year. Other improvements coming in the first quarter will enable MSN, currently single-user only, to operate on Windows NT LANs and Novell, Inc.'s NetWare. Later next year, it will release Windows NT and Macintosh-specific versions. Designed for 32-bit systems, MSN won't run on Windows 3.1.

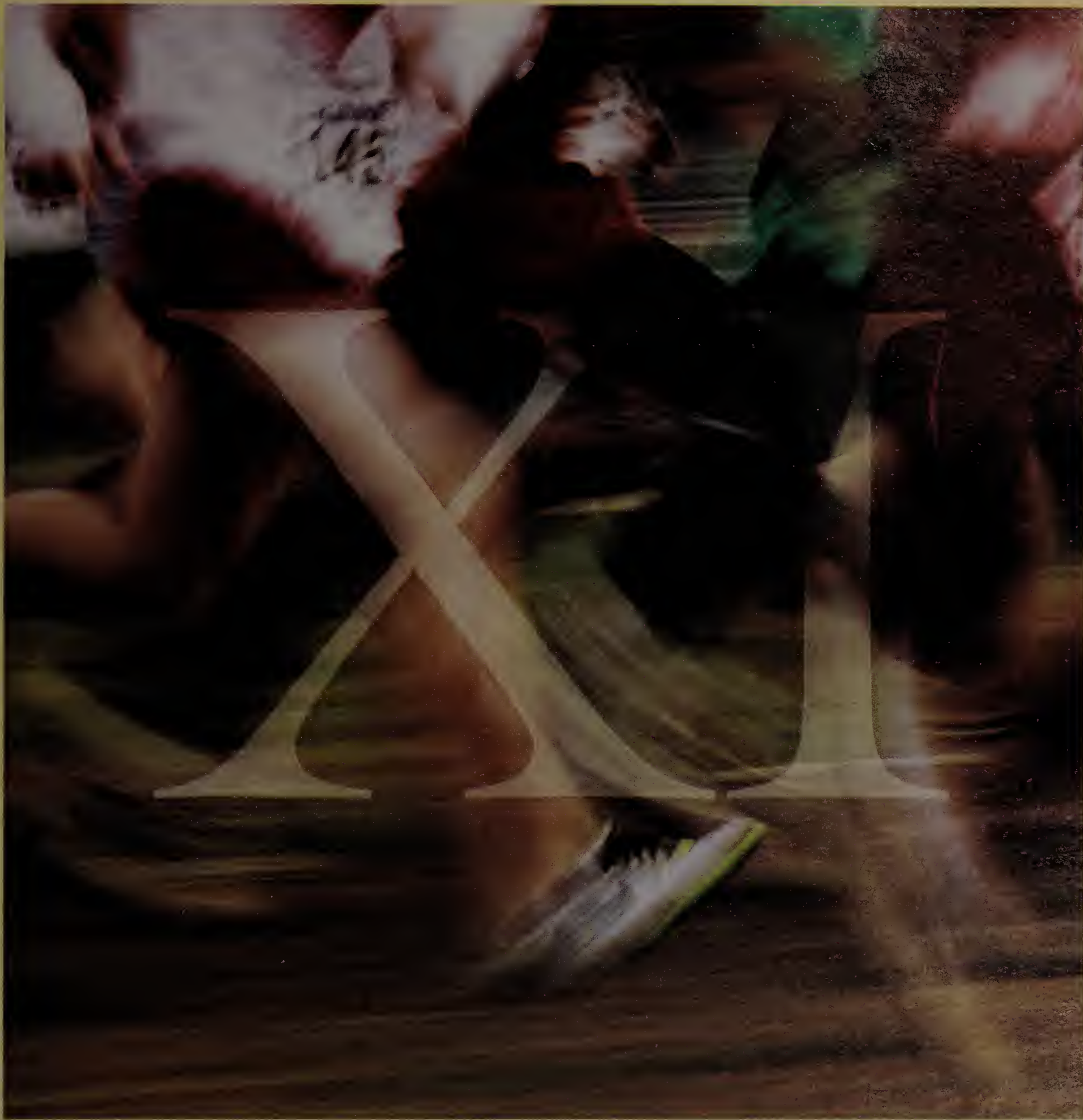
MSN's tight integration with Windows 95 does offer convenience and performance benefits. They share an easy-to-use interface, multitasking and a memory management system. You can drag and drop an Internet hyperlink, a World Wide Web home page or a "Favorite Place" icon onto the desktop or into a folder or document. Clicking on it launches MSN and delivers you directly to your destination.

Millman is an independent consultant based in Croton, N.Y. He can be reached at hmillman@mcimail.com.

Test procedure

For our unstructured tour of MSN and its Internet companion, we used a clone 66-MHz 486DX2 box rigged with 16Mbytes of RAM and a 28.8K bit/sec. modem. We spent

about two hours cruising through the services' electronic landscapes, visiting a dozen or so news, entertainment and technical information sites.



THE RACE BEGINS OCTOBER 30.



New Products

Centigram Communications Corp. has introduced the Series 6 line of communications servers.

The San Jose, Calif., company said the Series 6 servers are next-generation hardware and software platforms for integrated voice, fax and data messaging.

The products expand users' choices in communication vehicles and provide access to a broad range of messaging options, including telephony applications, remote access, one-number services and digital connectivity.

The Series 6 servers are based on Centigram's modular expandable system architecture for system and application expansion. They offer up to 240 ports and 2,880 hours of storage in a single system

and maintain a consistent user interface and software base across all models. They include TCP/IP Ethernet connectivity, letting users digitally exchange messages among as many as 1,500 system nodes and at speeds of up to 10M bit/sec.

Pricing for the Series 6 servers starts at \$9,500.

► *Centigram Communications*
(408) 944-0250

Olicom, Inc. has introduced the Ethernet ISA/IV family of Industry Standard Architecture (ISA) adapters.

According to the Plano, Texas, company, the adapters are available in two models: the ISA/IV CAT Adapter and the ISA/IV T Adapter. The ISA/IV CAT Adapter supports a variety of media types, including coaxial baby "N" connector for direct connection to thin Ethernet coaxial cables. The ISA/IV T Adapter has an RJ45 connector.

The adapters feature 32K-bit buffer memory to reduce traffic overhead and 32-bit drivers for increased performance and lower CPU use. Drivers are supplied for major operating systems such as Novell, Inc.'s NetWare, IBM's LAN Manager and Microsoft Corp.'s LAN Manager, Windows for Workgroups and Windows NT.

The ISA/IV CAT Adapter costs \$85. The ISA/IV T Adapter costs \$62.

► *Olicom*
(214) 423-7660

The AG Group, Inc. has unveiled NetMeter 1.0, a real-time network monitoring application for Macintosh networks.

According to the Walnut Creek, Calif., company, NetMeter 1.0 displays network traffic data in various customizable meter formats. Each meter is a visual or audio presentation of specific pieces of network information selected by the user that allows network managers to focus on devices and traffic important to their specific network environments.

NetMeter 1.0 lets users view data collected by AG Group's Satellite data collection engine. It provides real-time information with a variety of data options, including overall network use; single node, single protocol or subprotocol; and specific conversation.

Pricing for NetMeter 1.0 starts at \$395. The package includes the NetMeter application, eight NetMeter Modules and one Satellite data collection engine.

► *The AG Group*
(510) 937-7900

Focus Enhancements, Inc. has introduced EtherLAN Hub 16 V, a stand-alone 16-port repeater hub.

The Woburn, Mass., company said EtherLAN Hub 16 V has 16 10Base-T ports and one port for unshielded twisted-pair connectivity with PCs, Unix workstations and IBM AS/400s.

A baby "N" connector provides thin Ethernet connection allowing up to 30 devices to be joined through standard coaxial cable and T-connectors. EtherLAN Hub 16 V can also serve as a node on any thin Ethernet backbone or segment.

The product provides automatic partitioning and reconnection. It can be cascaded with another EtherLAN Hub 16 V using standard 10Base-T cabling. It also includes its own power switch and internal power supply.

EtherLAN Hub 16 V costs \$440.

► *Focus Enhancements*
(617) 938-8088

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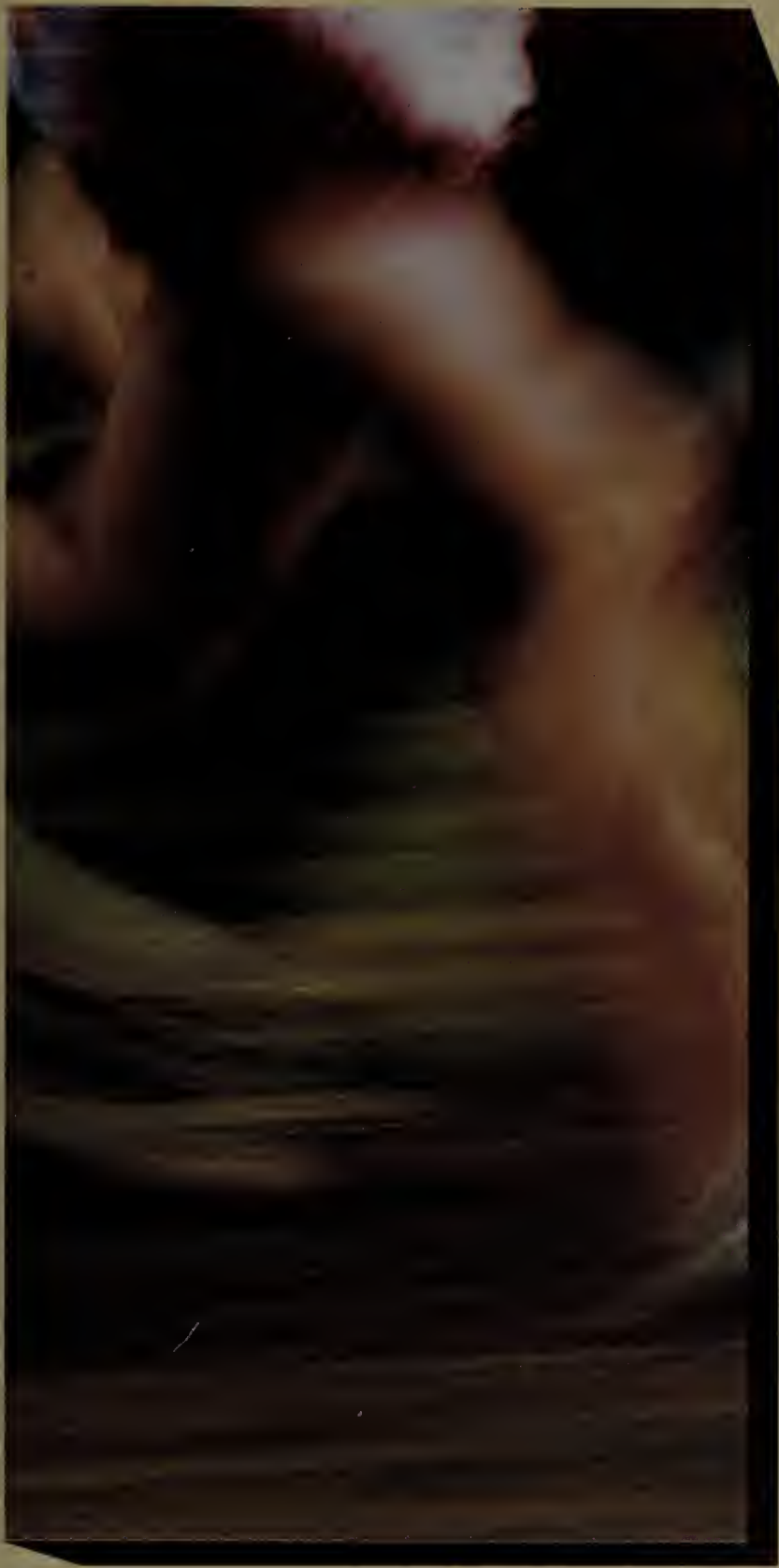
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Dana Quitslund lives and works on Bainbridge Island, Washington. His office was designed by Wind and Tides, Ltd., a wholly owned subsidiary of Mother Nature, Inc.

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OS/390 bundle to save hassle

By Craig Stedman

If change is good, then System/390 shops have some great times ahead of them.

IBM's plan to bundle its MVS operating system with several dozen supporting products should completely alter the way software is viewed in data center life. If the strategy

works, it will release customers from having to painstakingly upgrade mainframe software one piece at a time, in what amounts to a never-ending cycle of integration and testing.

Detailed this month and due to ship next March, the new OS/390 environment is supposed to shift much of the software integration burden, and its high cost, to IBM. A half-dozen System/390 users applauded that idea and also approved of the price breaks that IBM said will accompany the bundling.

But some users said the magnitude of

the upcoming changes is a bit daunting since customers will be asked to make a leap of faith and put their trust in IBM's integration skills. IBM must also still flesh out many of the details of OS/390, starting with pricing, users said.

"There are all kinds of questions that IBM has to answer," said Paul Moore, manager of data processing operations at Huntington Service Co., the information systems unit of Huntington Bancshares, Inc. in Columbus, Ohio. "The concept is great, and I hate to be skeptical, but on the other hand, I am."

IBM has "seen the handwriting on the wall and figured out this is where they have to go" to make mainframes more competitive with smaller servers, said Jeff Grigg, principal technical support analyst at Bath Iron Works Corp. in Bath, Maine. But plans to augment the initial OS/390 bundle with database, transaction processing and third-party software are "very nebulous" and could ask cus-

tomers to swallow too much change at once, Griggs said.

Charlie Burns, an analyst at Gartner Group, Inc. in Stamford, Conn., said the load-and-go nature of OS/390 will let mainframe shops cut their testing cycles and install software on a more defined schedule. Today, upgrading MVS "is kind of like painting the Golden Gate Bridge. There's always something that needs to be done," Burns said.

However, IBM has to prove to data center denizens that its standardized integration and testing fits the bill. With OS/390, "you're changing everything in the shop. That's something most people look at with a reasonable amount of trepidation," Burns noted.

Charles Lickel, vice president of System/390 business plans and systems architecture at IBM, agreed that customers "have to build up their confidence level as to how much change they're willing to make at one time."

IBM still will let users buy and install

Get it together

These key software products will be part of the base version of IBM's new OS/390 mainframe operating system

System services

- MVS/ESA 5.2.2 operating system
- DFSMS storage manager for active data
- JES2 job-entry scheduler

Unix services

- OpenEdition MVS with support for Unix APIs
- OpenEdition shell, utilities and debugger

Communications and distributed computing

- VTAM 4.3 terminal-to-host software
- TCP/IP for MVS
- OpenEdition DCE base services
- LAN Server for MVS

Application development

- SOMobjects object request broker*
- VisualLift graphical user interface*

*Runtime versions

existing versions of MVS and the other bundled products one piece at a time, Lickel said. But future releases will be sold only within OS/390, he said.

OS/390, page 84

Translation software picks up steam as demand booms

By Dan Richman

Remember the joke about the literal-minded interpreter who translated the English expression "Out of sight, out of mind" as "Invisible, insane?" That is not too far-fetched when applied to software that translates human languages — a technology that remains primitive even after decades of effort.

Yet the market for translation software is booming.

"I doubt anything will ever replace human translators, but we consider computerized assistance invaluable here."

— Jonathan Yanover,
translation manager,
Atlanta Committee for the
Olympic Games

Ovum Ltd., a computer industry analysis firm in London, predicts that the current \$200 million market for translation software will balloon to \$1.5 billion by the year 2000. The greatest growth will take place in software for Japanese translation.

Users say translation software, while not a sledgehammer to bring down the Tower of Babel, is nonetheless indispensable.

"I doubt anything will ever replace human translators, but we consider computerized assistance invaluable here," said Jonathan Yanover, translation manager of the Atlanta Committee for the Olympic Games, which is readying the infrastructure for the Centennial Olympic Games in July 1996. "Our documents are widely varied and numerous. We'd be lost without computerized help."

Translation software can be useful to any company working in more than one language. The most challenging — but disappointing — technology is called machine translation. It parses sentences and automatically renders words and short phrases in another language.

But computer science thus far has been unable to re-

Translation software, page 84

Philips Semiconductor addresses backlogs

The business challenge: Semiconductor stocks have taken a beating on Wall Street lately as analysts heighten their concerns about swelling computer chip inventories. To help reduce its backlog and measure customer profit margins more effectively, Philips Semiconductor in Sunnyvale, Calif., recently began installing a data warehouse based on Information Builders, Inc.'s Focus.

The technology used: Philips' mainframe-based data warehouse was designed to collate worldwide sales data from 43 sales databases dispersed across North America, the Far East and Europe. Sales data is extracted from these databases on flat ASCII files, electronically transmitted over TCP/IP networks to Philips' Sunnyvale data center and uploaded onto the Focus data warehouse, which resides on a Toshiba America Information Systems, Inc. mainframe running IBM's MVS/VM operating system.

Project costs: \$120,000 for Information Builders' Focus Executive Information System (EIS) for Windows application programming; \$25,000, or \$500 per seat for 50 users, for EIS software; and \$200,000 to \$400,000 to be allocated for an undetermined Unix server, according to Steve Moore, a controller in the Standard Integrated Circuits Business Group at Philips Semiconductor in Sunnyvale.

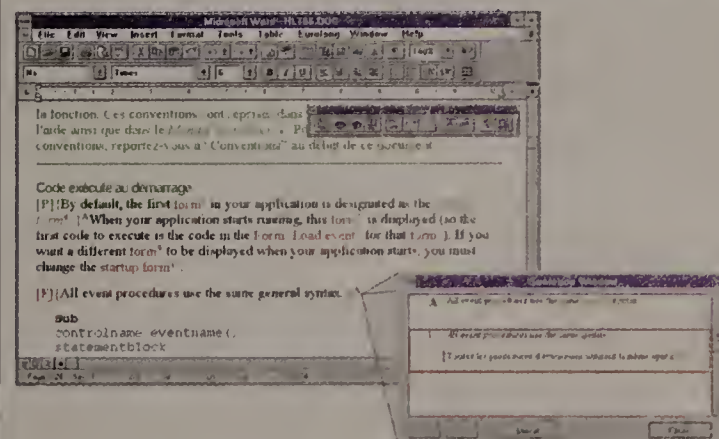
Business benefits achieved/expected:

Using Focus EIS for Windows, 38 sales and marketing executives from Philips' U.S. and European offices can access daily sales information from the U.S. and monthly sales statistics from Europe and the Far East. This information is stored in Philips' Focus/VM database in Sunnyvale.

The company no longer needs to dedicate 300 to 400 programmers to extract product-specific sales information for Philips executives.

By Thomas Hoffman

Philips' IS department in Sunnyvale no longer has to print out 200 lbs. of monthly sales data for sales executives to weed through, according to PJ Matarese, a senior programmer/analyst at the Microcontroller Products Group at Philips Semiconductor.



Word processors such as Microsoft's Word increasingly offer foreign-language translation

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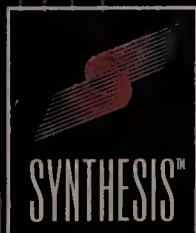
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Vendors take aim at metadata standard

Six join effort to bridge warehousing products

By Dan Richman

Six vendors involved in data warehousing have pledged to lead a drive toward standardized metadata, which they say will let users mix and match multiple vendors' warehousing products.

Metadata is information about data in a warehouse. It is as essential as the data itself, telling users how the data was created, where it is from, what it means, how it has been summarized or quantified and how it has changed over time.

Every product in the data warehousing market requires metadata, and some generate it. But each product uses a slightly different format.

That means, for example, that a site using one vendor's end-user query and analysis tool might require significant information technology assistance to use another vendor's data extraction and cleansing tool to extract data from production databases.

Keeping the edge

To fix this problem, the vendors — Arbor Software, Inc., Business Objects, Inc., Cognos Corp., Evolutionary Technologies, Inc., Platinum Technology, Inc. and Texas Instruments, Inc. — on Oct. 10 formed the Metadata Council, which, along with one end user, will release an initial specification by year's end, officials said.

The specification will set out the format and structure that metadata should take to be interchangeable among compliant vendors' products. But it will also allow for extensibility, so vendors can keep competitive advantages, she said.

One user reacted optimistically to news of the council's formation.

"That kind of standard would be enormously valuable," said Andrew Black, decision-support manager at Dayton-Hudson, Inc., a retailer in Minneapolis. "We've got three divisions using different tools, each with its own metadata needs, which when you think about it is a sort of vendor lock-in. It sounds like this could lead to having all those tools with only one metadata format."

But users won't receive any benefit until 1997, predicted Meta Group, Inc., a Stamford, Conn., consultancy that said it coordinated the council's creation to advance its end-user clients' interests.

"We all felt pressure from users who want to choose whatever products they want and be able to exchange metadata without coming up with homegrown remedies," said Patti Nghiem, co-chairwoman and vice president of technical services at Business Objects.

At least one other vendor — Prism Solutions in Sunnyvale, Calif., a data extraction and cleansing company — has said it intends to participate in the council's efforts.

Scheduling software for RS/6000 due

Fourth Dimension Software, Inc. in Irvine, Calif., is expected to announce this week that its Control-M production control and job scheduling software will become available this year for IBM's RS/6000 SP parallel processing computers. Control-M for RS/6000 SP pricing starts at \$8,400 per node; the related Enterprise ControlStation Component starts at \$15,995.

Encore releases disk array

Encore Computer Corp. in Fort Lauderdale, Fla., has introduced an expanded version of its Infinity SP disk array that supports data sharing between mainframes and other servers. Scheduled to ship this quarter, the SP40 uses a ring-like architecture similar to what IBM is designing for its multiplatform Seascape storage devices due out in 1996. Multiple SP40 controller nodes can be linked together, with each group of two supporting up to 689G bytes of disk storage, Encore said.

Briefs

Analysis tool to be ported to MVS

Mortice Kern Systems, Inc. will port its Code Integrity source-code analysis tool to IBM's OpenEdition MVS mainframe operating system. The new version will ship in the first quarter of 1996.

Compuware gets connected

Compuware Corp. in Bloomington Hills, Mich., has introduced EcoConnect, a component that links the company's EcoTools system and application management product to leading management platforms and help desk applications. EcoConnect integrates EcoTools with Hewlett-Packard Co.'s OpenView, IBM's NetView, SunSoft, Inc.'s Solstice and Tivoli Systems, Inc.'s Tivoli Management Environment. EcoConnect is available now; prices start at \$23,000 and depend on system configuration.

Translation software vendors

MACHINE TRANSLATION: Automatic translation of words and short phrases

Product	Logos	• Transcend • DP/Translator	Systran Translator
Vendor	Logos Corp. Mount Arlington, N.J. (201) 398-8710	Intergraph, Inc. Huntsville, Ala. (205) 730-3046	Systran Software La Jolla, Calif. (619) 459-6700
Platforms supported	SPARC Solaris, Sun OS	Transcend (Windows); DP Translator (Intergraph Unix)	MVS, Unix, Windows

TRANSLATION MEMORY: Database storage and searching for larger phrases and sentences

Product	TM2	Optimizer	Translator Workbench
Vendor	IBM Armonk, N.Y. (800) 426-4862	Eurolang Paris (800) 898-9043	Trados GmbH Stuttgart, Germany (619) 298-8300 (619) 794-6399
Platforms supported	OS/2, Windows	Client: Windows Server: NT Server	DOS, Windows

Translation

CONTINUED FROM PAGE 81

create in silicon the ability to understand context, making machine translation products useful only for limited sets of words, such as parts lists. Only incremental improvements can be expected, several vendors said.

Another technology, called translation memory, stores manually translated phrases and sentences in a database and matches them with the document being translated. It is useful for longer documents, such as sales brochures and computer documentation. Improvements in fuzzy logic and indexing will likely propel this technology to greater efficiency.

Fueling the growth in translation software are new integrations of products, availability on less expensive platforms and the growing internationalization of business, said Brian Briggs, president of Scitech Language Partners, Inc. in Chicago, a supplier of translation software.

An increasing number of vendors are integrating machine translation software and translation memory packages. When a match for a word or phrase is not found in the translation memory database, the string is kicked into machine translation, said Mark Berry, president of MCB Systems, a translation software

reseller in San Diego.

Several products are also being integrated with one or more vendors' word processors so that translations can be easily initiated from and incorporated within documents.

Translation software is increasingly available on inexpensive platforms. For example, Intergraph, Inc., a workstation and server vendor in Huntsville, Ala., ported its Transcend machine translation product from Digital Equipment Corp. Unix to Microsoft Corp.'s Windows NT about a year ago. Most other translation software vendors also have ported their products to NT, some just within the last year.

The next big hurdle that translation software faces is handling Japanese, a special challenge because of its use of ideograms rather than letters.

"Japanese is definitely next on the list" of languages that on-line service CompuServe will add to its World Community Forum, which automatically translates messages in English, French, Spanish and German bidirectionally, said Mary Flanagan, group leader for natural language technologies in Waltham, Mass.

Companies needing automated translation will pay "from about \$500 for something to roughly translate E-mail messages to \$30,000 for a system that puts manuals and documents into another language," Briggs said.

OS/390

CONTINUED FROM PAGE 81

IBM plans to update OS/390 every six months by adding new versions of products that are ready at that time. Pricing isn't finalized, but the bundling could shave up to 30% off monthly license fees at large mainframe shops and 50% at smaller sites, Lickel said.

Actual savings will depend on how much of the bundled software customers already have and how old it is. Since IBM's prices usually rise with new re-

leases, the discounts "won't be as big if you consider the packaged [OS/390] price against older versions" of software, Burns said.

But even then, the reduced integration and test load should be kind to IS budgets.

OS/390 "would never be a plug-and-play type thing because [MVS] is the lifeblood of our company," said Virgil Pittman, senior vice president of IS at Fireman's Fund Insurance Co. in Novato, Calif.

"But in principle, we should be testing all of that once rather than having to set up a different test for each piece."



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New Products

Prism Solutions, Inc. has announced Prism Warehouse Manager 4.3, data warehouse management software designed to reduce the time and cost of building and maintaining data warehouses.

According to the Sunnyvale, Calif.,

company, Prism Warehouse Manager 4.3 is an open architected data warehousing product. It includes robust data extraction capabilities, advanced transformations, active metadata collection and support for multiple source and target databases on mainframe and client/server platforms.

The product has productivity enhancements, including data mappings for flexible processing of source files. It

also provides support for SAP America, Inc.'s R/3, IBM's AS/400 and Teradata Corp. sources.

Prism Warehouse Manager 4.3 includes features for many-to-many mappings to allow inputs from multiple source file types; warehouse updates to let users replace, insert or delete rows in data warehouses; the reuse of business rules and user exit routines; and IMS direct read.

The product extracts data from SAP R/3 applications on Digital Equipment Corp. and Unix platforms, DB/400 databases on AS/400 platforms and Teradata databases on IBM MVS and AT&T 3000 Unix platforms.

A Prism Warehouse Manager 4.3 license is \$130,000 and includes a transformation module with three concurrent developer workstation seats, one source database module and one target database module.

► **Prism Solutions**
(408) 752-1888

Lingo Computer Design, Inc. has introduced Fiscal.

Fiscal is a complete open architecture for rapid implementation of on-line analytical processing (OLAP) and decision support. According to the Toronto company, Fiscal is the most extensive architecture for OLAP.

It features a multidimensional OLAP server that runs native mode on Oracle Corp., Sybase, Inc. and Informix Corp. database management systems on any server hardware. It also has an end-user data exploration tool that runs on popular graphical user interfaces, including Microsoft Corp.'s Windows and Windows NT, IBM's OS/2 Presentation Manager and the Macintosh.

Fiscal includes corporate modeling technology that permits top-down design and tools for the creation of an operational data store or data warehouse.

Pricing for Fiscal starts at \$85,000 for a 25-user license.

► **Lingo Computer Design**
(416) 593-5334

Client/Server Technology, Inc. has introduced GUI Sys 3.0, legacy migration software.

According to the Atlanta company, GUI Sys 3.0 offers fully automatic migration of mainframe and midrange legacy applications to a client/server environment under Windows or OS/2. It was designed to make the migration of legacy applications to Windows-based applications as seamless and transparent as possible.

GUI Sys 3.0 features KnowledgeBase, which a company can customize according to the particular standards found in its legacy system. The KnowledgeBase monitors the flow of an application while it is in use and analyzes the way the screen is presented to the user.

The product combines this information with corporate preference format information to automatically convert character-based screens into customized Windows-based screens without changing the original program code.

GUI Sys 3.0 features multiple session support, full accelerator support, automatic application development and advanced message handling. It creates graphs from the data in host subfiles, including invisible pages, and a uniform graphical user interface.

Pricing for GUI Sys 3.0 starts at \$13,500.

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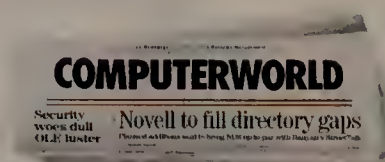
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OLE gets graphic

Prospero 'building blocks' can help developers link, write apps

By Frank Hayes

Almost every major PC application that runs under Windows supports OLE, Microsoft Corp.'s system for linking software components. But almost no corporate development shop uses it to its full extent.

OLE technology makes it relatively simple for users to link applications. For example, a user can merge a piece of a spreadsheet into a word processing document. OLE also can perform more complicated tasks, such as moving data between applications automatically, by using OLE automation.

But most corporate developers shy away from using those capabilities because writing applications that use OLE programming interfaces has been notoriously difficult.

Instead, developers typically write

macros to export the data from one application and import it into another, said Diana Leccese, a technical specialist at VP Solutions, Inc. in Framingham, Mass.

New on the scene is Prospero, a development tool from Oberon Software, Inc. in Cambridge, Mass. Prospero was designed to make it much easier to use OLE by giving developers and power users a graphical environment in which to link OLE-enabled applications, said Leccese, who beta-tested the system.

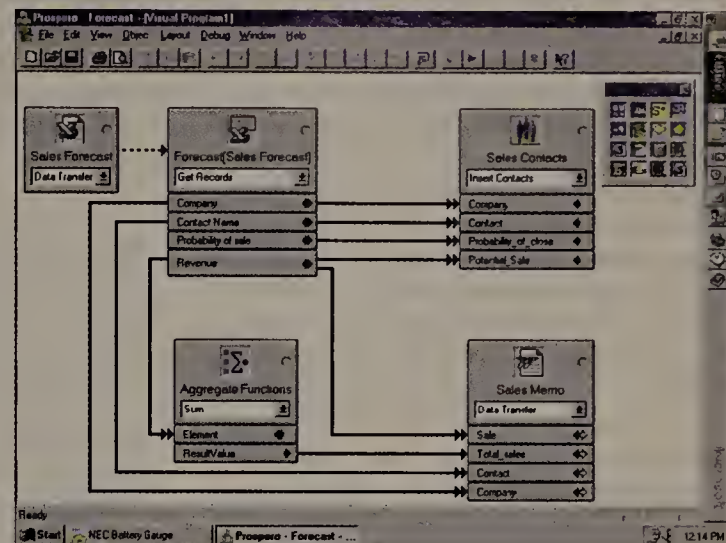
Prospero also can link data from databases that use Microsoft's Open Database Connectivity protocol and applications developed using Notes.

From each application or database, Prospero automatically generates "building blocks" that represent data or an application function. Developers then link data and functions by drawing lines between them using a mouse. If the task

is to feed mailing list information from a database into a word processor, "Prospero builds a block with all the fields in the database, and then all you do is draw a line to connect it to all the places you want it to go inside your word processor," Leccese said.

Developers also can use Microsoft's Visual Basic-compatible scripting language to create their own building blocks that contain dialog boxes, formulas and if/then/else logic to make even more complex connections between applications.

The connections between the building blocks can be developed and tested un-



Oberon's Prospero generates 'building blocks' that represent data or application functions. Developers can link data and functions by drawing lines between them using a mouse

der Prospero, then used to generate an executable file that runs using only a Dynamic Link Library (DLL) file. There is no runtime charge for the Prospero DLL.

Prospero runs under Microsoft's Windows 3.1, Windows 95 and Windows NT. It is shipping now and costs \$695.

IS, users take team approach

Business process re-engineering gains popularity, improves efficiency

By Frank Hayes

It is really no wonder that businesspeople and corporate developers have a hard time communicating. The former are concerned with creating, buying and selling goods and services, while the latter are focused on moving and transforming data. What a business user tries to describe in terms of customers and inventories, a developer sees as entity-relationship diagrams.

Bridging the gap between the two worlds isn't easy.

Working together

A popular approach is business process re-engineering (BPR), where developers don't just computerize existing systems. Instead, they work with users to determine how work and information move among business functions and then design a system that will make the business more efficient. Only then is the software actually developed.

BPR "allows the system designer to better understand the

business, and for a business analyst to really question the efficiency of the process before [going] into a systems design," said Brad Masters, senior business systems analyst at Webcraft Technologies, Inc. in Horsesham, Pa.

"Re-engineering gains its strength from redesigning business processes and information systems at the same

time," Masters said.

Unfortunately, today's BPR tools tend to be simple workflow-diagramming tools or elaborate systems aimed at large-scale development.

Midlevel target

Taking the middle ground is Sterling Software, Inc., which is targeting the needs of users who want to design and build workgroup-size applications.

The Atlanta-based company last week rolled out Key for Workgroup, a Windows-based BPR tool set that lets users and developers analyze workflow and generate applications.

Developers and business analysts can model a business's current organization and flow of operations, said Earl Sabot, a systems analyst at Cygnus Application Solutions, Inc. in Roswell, Ga., who beta-tested Key for Workgroup.

The development system then can generate application code directly from the

business model, Sabot said. Key for Workgroup comes with Sterling's Key:Assemble, its own rapid-development language, and components for generating applications.

Developers also can generate code in Microsoft's Visual Basic using a Key:Empower for Visual Basic module, or in Powersoft Corp.'s PowerBuilder using a Key:Empower for PowerBuilder module, Sabot said.

"This concept of going from BPR directly into rapid development is the direction of the industry," said Mike Blechar, a research director at Gartner Group, Inc. in Stamford, Conn.

"BPR will be replacing all other means of planning over the next several years. It will also lead directly into object-oriented analysis and design and the use of object-oriented tools," he said.

Pricing set

The Key for Workgroup suite is available now. Pricing starts at about \$25,000 for four concurrent users. Individual parts of the suite can be purchased separately at \$1,499 for Key:Advise, the analysis module; \$4,999 for Key:Model, the modeling module; \$3,499 for Key:Assemble; and \$1,499 for Key:Empower for Visual Basic or Key:Empower for PowerBuilder.

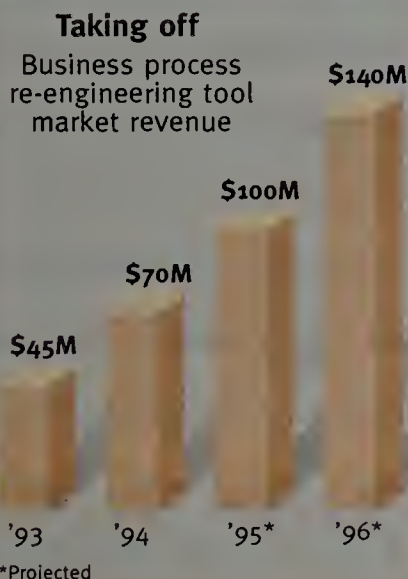
Briefs

Pipes Platform ships

PeerLogic, Inc. in San Francisco last week introduced an enhanced version of Pipes Platform, the company's middleware that allows applications on different platforms to communicate. Enhancements include management utilities, expanded network support for Novell, Inc.'s NetWare and Microsoft Corp.'s Windows NT and support for connecting Microsoft Visual Basic applications to Unix or mainframe CICS applications. Pipes Platform is shipping now. Pricing starts at \$200 for Windows, \$1,200 for Unix and \$50,000 for mainframe MVS environments.

Benchmarking boon

The International Software Benchmarking Standards Group has come to the U.S. The group, which is made up of members of European and Australian software metrics associations, works on user-oriented standards for software benchmarking.



Source: Gartner Group, Inc., Stamford, Conn.

Companies hop on-line with tool from Australia

By Emily Gin

A company Down Under recently released a tool designed to help companies get up on the World Wide Web.

Australia's Open Software Associates (OSA) has introduced OpenWeb, which it claims is the only tool that creates client/server applications for both private networks and the Internet.

OpenWeb is an application development technology that enables a company to place distributed applications on the Internet. The technology is built into OSA's OpenUI product, which is a client/server, graphical user interface application development environment that works across multiple platforms.

OpenUI is a message-based architecture and cross-platform user interface management system.

John Schmidt, OSA's marketing development manager for Asia, said more companies are using the Internet infrastructure as a cost-effective way to extend their private networks. This means they have a need for a distributed application development tool. OpenUI lets developers use Cobol, C or C++ as their programming language. OSA is targeting large organizations for its OpenWeb and OpenUI products, such as major financial and banking institutions and telecommunications companies.

While OSA won't provide a security product for its clients, it will assist them in implementing a security system and ensuring the compatibility of the system

with OpenUI. OpenWeb works with standard user authorization, authentication and encryption security technologies, Schmidt said.

Corporate client/server applications and databases intended for the Internet can remain on the company's internal

network and don't need to be transferred to a Web server. To allow access to the client/server application from the Web, developers must create a link on their home pages that points to the downloadable client application module or user interface on the Web server.

Once the connection is made between the Web server and the internal network application, OpenUI's message-based architecture passes all application calls to the internal corporate server.

Gin writes for *Computerworld Hong Kong*.

Simple Question.

Brian
Can you tell me what products
grew by more than 10% over
last year and where?
Janice
P.S. I know you're busy
but I need these ASAP!!

New Products

Softool Corp. has introduced CCC/Harvest 2.0.

According to the Goleta, Calif., company, CCC/Harvest 2.0 manages application development processes and software changes in cross-platform, client/server environments. The product was designed for platform interoperability. It supports Unix, Microsoft Corp.'s Windows and Windows NT, IBM's OS/2 and OpenVMS and Macintosh.

Pricing is based on concurrent users and starts at \$1,200 per user.

► **Softool**
(805) 683-5777

Terasoft Technology Corp. has introduced OEW for C++.

According to the Milford, Mass., company, OEW for C++ is a productivity tool kit for C++ developers. It includes reverse-engineering capabilities that promote the reuse of any C++ code, not just the code it produces. The product is available in English and German for Microsoft's Windows, Windows 95 and Windows NT and IBM's OS/2 Warp. It costs \$795.

► **Terasoft Technology**
(508) 634-8400

Chances are you're altogether too familiar with "simple questions" like these. Invariably, they come at the worst possible times. Usually, they require immediate attention. And, more often than not, there's hardly anything simple about answering them. Unless, of course, your organization is one of the thousands that have come to rely upon LightShip®, from Pilot Software, for the power of answers on demand.

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Answers on Demand.

New Products

Xerox Corp. has announced TextBridge Application Programmer Interface (API), supporting Microsoft Corp.'s Windows 95 and Windows NT operating systems.

According to Xerox's Imaging Systems division in Peabody, Mass., TextBridge API is a C/C++ developer's tool kit de-

signed for integrating high-end optical character recognition capabilities into third-party applications using Microsoft's Visual C/C++ development environment.

TextBridge API features a natural language system for increased recognition of words commonly found in business documents that aren't true words. It includes support for 12 foreign languages.

The product also has automatic preprocessing capabilities, including page segmentation, rotation and noise removal.

It recognizes font sizes between five and 72 points and supports open-faced books and magazines.

Pricing for TextBridge API's basic tool kit starts at \$5,000.

► *Xerox*
(508) 977-2000

Geodesic Systems, Inc. has unveiled Great Circle, an automatic memory management product for C and C++.

According to the Chicago company, Great Circle automatically prevents and fixes memory management bugs, memory leaks and loose pointers without requiring any source code changes. It analyzes a program's data structures and automatically frees any memory no longer in use.

Great Circle was designed for programmers of all skill levels working on new and existing source code. It facilitates the reuse of existing code and includes garbage collection technology that eliminates the need for application-specific memory management schemes. It provides a C++ smart pointer interface and is available in compiler and operating-system-independent C++ source code that lets developers target device drivers, unusual platforms and embedded systems.

Pricing for Great Circle starts at \$300 for PC versions and \$700 for workstation versions.

► *Geodesic Systems*
(312) 728-7196

JYACC, Inc. has introduced Jam 7 for the Macintosh, a cross-platform development tool.

According to the New York company, Jam 7 for the Macintosh lets developers build applications in the Macintosh environment and deploy them on more than 100 platforms and operating environments. The product has a Screen Wizard feature that lets users build database applications without writing code. Jam 7 for Macintosh supports Apple Computer, Inc.'s Required Apple Event Suites by providing a custom Event for addressing JYACC's Jam. This lets developers modify any Jam properties that can be assigned to screens or controls.

The product also generates objects at runtime. It features flexible grids and integratable tool bars for creating communicative graphical interfaces without coding.

Jam 7 for the Macintosh costs \$2,400.

► *JYACC*
(212) 267-7722

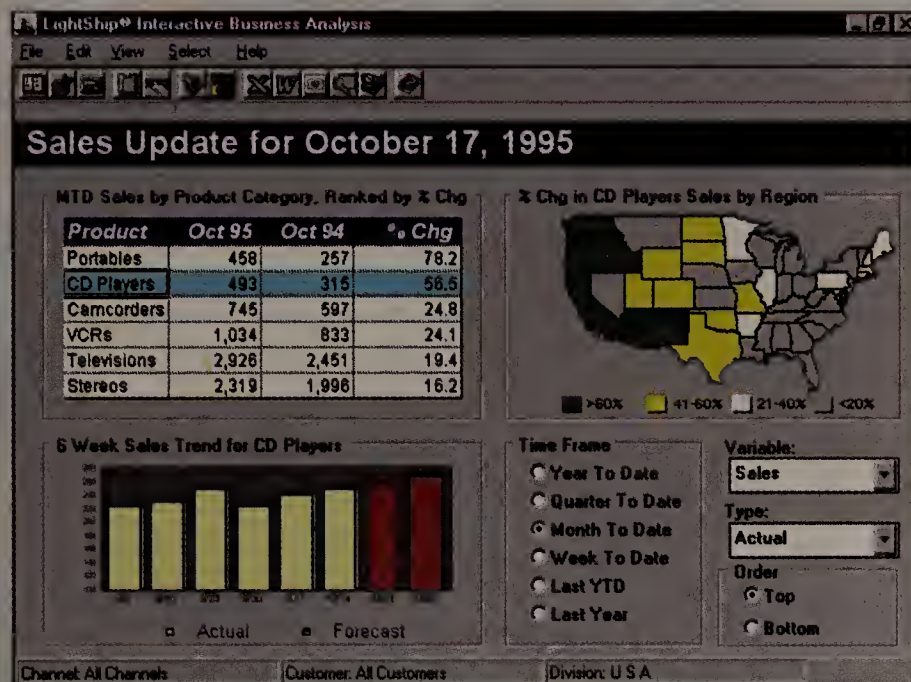
Viasoft, Inc. has introduced Via/Alliance 1.1, the application-understanding component of its Systems Workbench suite of tools.

According to the Phoenix company, Via/Alliance 1.1 locates hidden relationships buried in source code and lets users perform application impact-analysis tasks in minutes. It provides support for Computer Associates International, Inc.'s Endeavor/MVS source management environment and an export facility to Texas Instruments, Inc.'s Composer by IEF application development environment.

Viasoft pricing is based on the processing power of a designated CPU. Pricing for Via/Alliance 1.1 for a Group 50 machine starts at \$68,000. Seat pricing is also available.

► *Viasoft*
(602) 952-0050

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Five Ways

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Dr. James H. Goodnight
President, SAS Institute Inc.

Data Warehousing There's no better way to stage the data used in decision making. Put it where people can get to it without a lot of nonsense—and away from your on-line transaction processing systems. Your decision makers will get consistent and up-to-date data they can use—without dragging down the performance of your operational systems. Whether you need a complete end-to-end solution for data warehousing, a piece here or there, or just some good advice, we can help.

Business Intelligence You've heard all the buzzwords (EIS, DSS, OLAP, Intelligent Query, Visualization). But what do they all mean? As a collection of incompatible products, they could mean trouble. But together and fully integrated into a comprehensive decision support environment, they could mean making good business sense out of reams of raw data. We provide them all. And we can design just the right mix for you.

Technical and Analytical Tools Of course, decision making is not unique to the business side. If you have quality issues on the shop floor or need to analyze the results of your market research, we can deliver the industry's richest set of tools for handling virtually any analytical need.

Applications Development If you need to build decision making into customized systems to get a jump on the competition, count on applications development tools ideally suited for decision support. Count on ours. Our iterative approach to rapid applications development can shave months off of your development cycles, and get the right information into the hands of your decision makers faster.

Business Solutions Maybe you're not ready to tackle that system alone. You won't have to. Our professional services staff can help you as much (or as little) as you require. We can train you, sit beside you, or build complete decision-based applications to your specific requirements.

The Bottom Line Better decision making can give you the competitive advantage you've been looking for. And if you're a Fortune 500 company, there's an excellent chance we're already at work helping you. To find out the role our technology and services can play in your organization, and to receive our free guide, give us a call or send us E-mail at

cw@sas.sas.com

Visit us at booth #1264 at UNIX Expo.
Visit us at booth #1266 at Networld+Interop.



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Management

Lights!
Camera!
Access!



Entertainment giant MCA doesn't fool around when it comes to giving executives the information they need to make more money

By Rochelle Garner

George Brenner isn't your typical chief information officer. He is well-heeled, high-styled and more fit than his 50 years would suggest. His presence commands attention. Even Brenner's light-suffused office, with its plush cream carpet, Abbott & Costello movie stills and rose-colored paneling, reflects a level of power more often found among Hollywood deal-makers than heads of technology.

But this particular CIO works at MCA, Inc., the \$4.8 billion entertainment giant. MCA, which is 80% owned by The Seagram Company Ltd., has holdings in motion pictures, television, home vid-

eo, book publishing, music recordings, theme parks and retail stores. Like his MCA colleagues, Brenner is in the business of weaving dreams into reality. But instead of working with movies, television or music, he uses information to knit a system that fits executives' business needs like a \$1,000 suit.

Consider: Hundreds of MCA's 5,000 PCs and Macintosh computers can reach out and view 260 newspapers, magazines and trade periodicals. Stocks are updated every 20 minutes. Universal Studio's cable system delivers television to the desktop. MCA's mainframe, six AS/400s, three RS/6000s and 210 Unix Novell, Inc. NetWare and Internet servers reside on a fiber-optic backbone network that handles Token Ring, Apple Computer, Inc.'s Apple Talk and Ethernet.

So MCA executives across the country can call up information anytime, anywhere.

"We can look at MCA's theaters, pay TV, cable TV, home video and merchandising information for any movie, select it and see how we've done by region of the world," Brenner says.

The result: A cost analysis that cuts across five business units and compares marketing costs, advertising expenses and revenue on one screen. The benefits are enormous for MCA executives, who aren't particularly inclined to master data queries and manipulation. Slicing complex relationships between expenses and revenue into instantly meaningful pieces is impressive. But even more impressive is the access speed. One blink, and the information is on-screen.

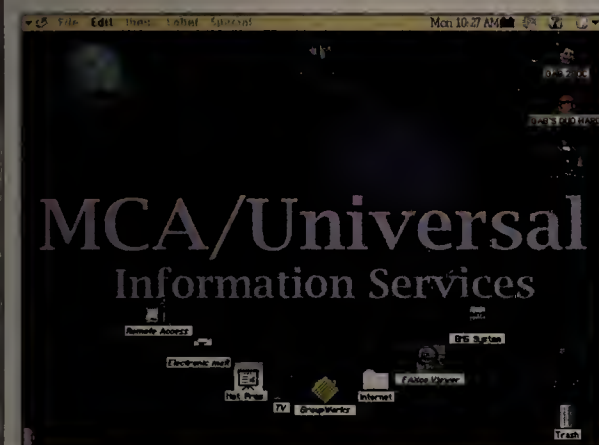


◆ Paul Strassmann's revealing indicators, Page 97

- Intelligence files, Page 98
- Calendar, Page 104

Lights! Camera! Access!

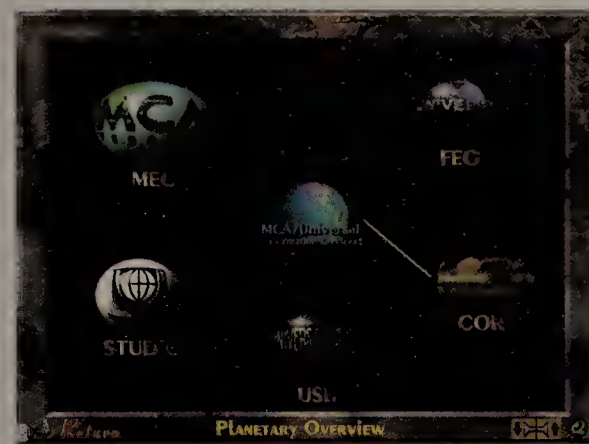
Welcome to our studio tour of MCA's executive information system



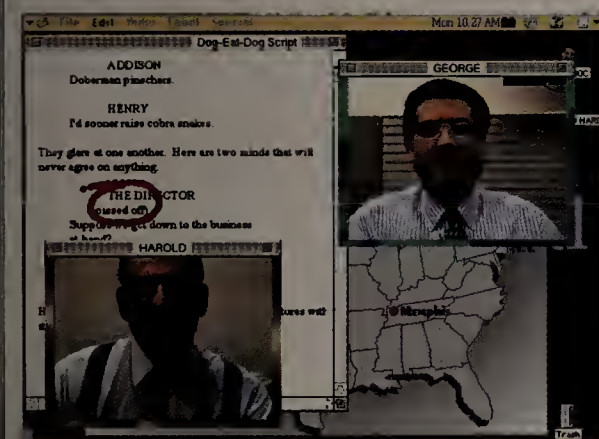
◆ According to Brenner, the desktop of the future will comprise faxing, videoconferencing, E-mail, video mail, TV and the Internet — all the better to communicate with.



◆ Looking for the latest from Universal Pictures? MCA's World Wide Web site [<http://www.mca.com>], which is on the network without first having to dial up, shows the new trend in electronic advertisements. It gives Universal another way to reach a target market in an advertising-driven business.



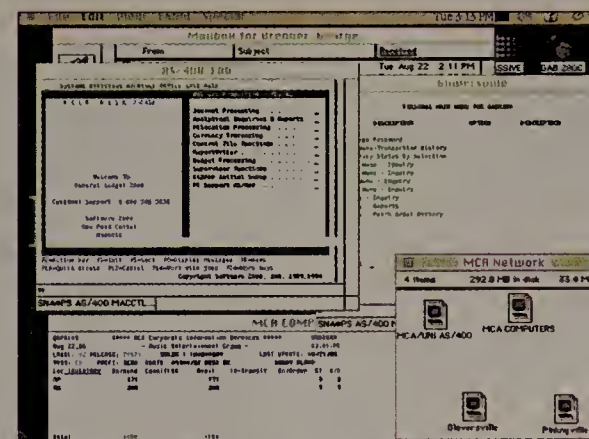
◆ At MCA, it pays to play the show-biz game when pitching for next year's budget. Brenner's presentation, written in MacroMind Director, shows upcoming IS projects for each of MCA's major divisions.



◆ The desktop of the future, as envisioned by Brenner, will permit the next mode of communication: video mail. With it, up to four people can sit down at their desktops and discuss, eye to eye, how text should be edited.



◆ Yes, it's the O. J. Simpson trial on CNN, but it's coming through Brenner's Macintosh, thanks to Radius, Inc.'s RadiusTV. The software highlights potential uses for this kind of content, including uploading dailies from the previous day's movie and television shoots so that executives can monitor progress.



◆ On one network, executives can call up the mainframe to review sales and inventory expenses, then compare that information against scheduled payables on an AS/400. Both systems are in the Los Angeles data center. An AS/400 in Gloversville, N.Y., reveals manufacturing schedules and costs.



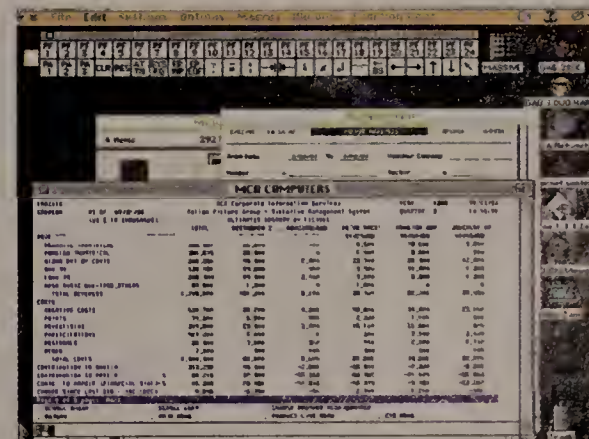
◆ Brenner's pitch for a new budget gets help from sound, motion and QuickTime movies. Executives from each of MCA's major divisions speak about why they need that next big IS project. And the process works. "I've gotten all the funding I've ever asked for," Brenner says.

His secret? Nearly 5,000 computer screens created to anticipate every conceivable query an executive could want. The screens that make up MCA's Executive Information System are updated nightly by mining various production systems of MCA's business units. The system tracks the multiple facets of MCA's business.

Brenner benefits from his system, too. He receives a nightly report from his Macintosh Duo Dock 280c about his department's previous three shifts across platforms. A daily status report lists help desk calls by type and division. His application development teams turn in on-line weekly progress reports.

"The maintenance and support of client/server is more costly than with legacy systems, but it's worth it in terms of the information it provides our people to run our business in a format they can understand," Brenner says. "The whole point is to give executives the information they need, as quickly as they need it."

Garner is a freelance writer in San Carlos, Calif.



◆ When it's time to make another movie about a cuddly Saint Bernard, it pays to know how a previous effort did in theaters at home and overseas. Just pop up the mainframe for that breakdown and compare it to theaters by city, region and date. Then pick up the financials on the AS/400.



Middleware.



Intelligent Middleware.



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PRODUCTIVITY is the measure of success

If you are an information systems professional who wants to build a career with a winning company, here's some advice: Don't judge a company by its size or the ratings that appear in most computer publications.

Many of the large companies that are widely promoted as "leaders in information technology" have slim profit margins. They are shedding employees and cutting back on research and development.

If you doubt this, compare the *Computerworld* Premier 100 companies with the Fortune 100 firms. The Premier 100 companies delivered 347% better sales growth and 334% better growth in shareholder equity than the Fortune 100 companies. The Premier 100 companies increased employment by 46.2%, while the Fortune 100 corporations cut jobs.

The following statistics strike down the notion that bigger is better. Last year, the average Fortune 100 company had 24 times more sales, 13 times more shareholder equity and 38 times greater sales, general and administrative expenses than the average Premier 100 company (see chart, "Bigger doesn't mean better").

Easy to make mistakes

It's easy for IS professionals to confuse size with success, particularly because most of the computer press makes the same mistake. Unlike the *Computerworld* Premier 100 [CW, Oct. 9], which lists corporations in order of their information productivity, computer publications select their Top 100 or 500 lists in ways that inevitably tilt the results in favor of large corporations. (Information productivity is defined as the economic contribution of information management divided by the costs of information management. See our Premier 100 issue to learn how to make this calculation.)

Some computer publications base their rankings on the proposition that bigger is always better. Their valuation schemes rank excellence based on a firm's IS budget, the number of LANs or PCs or its client/server population. Other publications rely primarily on consultants and vendors to be judges. Unfortunately, what constitutes a "reputation" in business these days is shaped largely by press releases from large corporations.

The statistics I gathered while preparing the Premier 100 list for *Computerworld* show that economic performance, not size or the number of PCs, is a far better indicator of excellence in the use of information technology. That isn't shown by comparing only the Premier 100 with the Fortune 100. Interestingly, even among the best companies, smaller

Paul Strassmann's



REVEALING INDICATORS

Whether you look at
sales, equity, R&D
investments or employ-
ment, the *Computer-
world* Premier 100
companies are growing
much faster than
Fortune 100 companies

If I were to seek a job today, I would give far more weight to the *Computerworld* Premier 100 ratings than those ratings published elsewhere.

However, a word of caution: 83% of jobs in the 5,000 U.S. corporations I examined are still at corporations with revenue in excess of \$1 billion. Just as big banks have more money than small banks, giant firms employ far more people than smaller companies.

The moral of this story is simple: The jobs may be with big companies, but exciting careers most likely will be with firms that keep generating economic growth through productivity gains. ■

Strassmann has served as chief information officer at major U.S. corporations and the U.S. Department of Defense since 1961. His Internet address is paul@strassmann.com. His World Wide Web address is <http://www.strassmann.com/>.

Bigger doesn't mean better

Companies are leaders based on productivity, not revenue

CW Premier 100 companies				Fortune 100 companies		
	1992	1994	% GROWTH	1992	1994	% GROWTH
Net sales	\$65.15M	\$92.08M	41.3%	\$1.94B	\$2.17B	11.9%
Shareholder equity	\$36.52M	\$56.87M	55.7%	\$628.03M	\$732.70M	16.7%
Sales, general and administrative	\$11.81M	\$13.71M	16.1%	\$497.96M	\$520.52M	4.5%
Research & development	\$2.90M	\$3.78M	30.3%	\$25.24M	\$22.99M	-8.9%
Employment	\$566,157	\$828,003	46.2%	\$9.71M	\$9.61M	-1.0%

Leaner but meaner

The growth rate of CW Premier 100 companies slows with size

Growth rates of companies	\$1 billion and above	\$1 billion to \$500 million	\$500 million to \$100 million	\$100 million and below
Sales	19%	33%	35%	39%
Net income	26%	41%	46%	54%
Shareholder equity	24%	44%	49%	66%
Sales, general and administrative	15%	31%	29%	34%
Research & development	21%	54%	69%	73%
Employment	10%	22%	34%	23%

Intelligence Files

Damned if you do, damned if you don't

Mainframe or client/server, IS just can't seem to win when it comes to impressing financial executives

In the eyes of many financial executives, information systems continues to be little more than a necessary evil, plagued by inefficient systems or minimal returns on investment.

That is the finding of three recent studies on IS performance and returns on investment for those who use mainframe or client/server systems.

In addition, corporate controllers are unhappy with IS spending on mainframe systems.

According to a survey of corporate controllers by the Institute of Management Accountants in Mont-

vale, N.J., nearly one-third of IS spending still goes to mainframe computers, despite the fact that those systems are considered Stone Age in efficiency.

"We were surprised to find that controllers in midsize to large companies say their systems are 15 years to more than 20 years outdated," says Susan Jayson, director of the institute's Controllers Council.

One controller at a medium-size manufacturing company in the Northeast described his IS department as "an old legacy system run by cavemen."

HOW CONTROLLERS VIEW THEIR INFORMATION SYSTEMS

Stone Age –
Not up to
the job

74%

World-class –
Highly
efficient

2%

Source: Survey of 2,200 corporate controllers by the Institute of Management Accountants

GREATEST OBSTACLES TO ACHIEVING WORLD-CLASS IS STATUS

1. Lack of sufficient staff and time.
2. Budget constraints.
3. No clearly defined enterprisewide technology strategy.
4. Lack of support from senior management.

Source: Survey of 2,200 corporate controllers by the Institute of Management Accountants

And meanwhile, the view doesn't get much better at companies that are moving to client/server.

Most chief financial officers and chief executive officers say they haven't seen any cost savings from implementing a client/server strategy, and the average IS budget decreased slightly this year.

According to a survey of Fortune 500 companies by Computer Economics, Inc. in Carlsbad, Calif., half have successfully implemented a client/server application.

But the majority said no when asked if they felt the client/server strategy had saved them money.

HAS CLIENT/SERVER PAID OFF IN SAVINGS?

Have implemented a
client/server application

50%

Have seen no cost savings
from that implementation

70%

Source: "1995 Information Systems Spending" survey by Computer Economics

The bottom line, many chief financial executives say, is that IS is a necessary evil. It is an operational expense rather than a strategic investment.

Because of that, most chief financial officers are likely to spend 60% or more of their IS budget on current systems rather than invest in new ones. But they rarely measure financial benefits from IS projects,

according to a recent survey by The Yankee Group in Boston and *CFO* magazine.

"They try to leave systems in place for as long as possible to exploit them as a cost when competing for budget resources, rather than looking at how systems impact profitability," says Kirk M. Klasson, vice president of The Yankee Group.

HOW CFOs VIEW THE VALUE OF IS

Operational
necessity

43%

Provides tactical
advantage

30%

Provides strategic
advantage

27%

Source: Survey of nearly 3,000 CFOs at medium-size to large companies by The Yankee Group and *CFO* magazine.

Surveys

New IS priority? Customers

Customer-focused investments will increase 400% in the next eight years

A study by Forrester Research, Inc. says the percentage of IS budgets at successful companies used for customer-related investments will skyrocket by the year 2003. The study predicts a dramatic restructuring of investment strategies as a result. It also predicts the Internet will revolutionize business relationships by lowering the cost of transactions, restructuring channels of distribution and eliminating barriers to geographically dispersed markets.

CUSTOMER-RELATED IS INVESTMENTS

YEAR	% OF TOTAL IS BUDGET
1995	10%
2003	40%

Source: "New Customers for IT" survey of Fortune 1,000 companies by Forrester Research

Internet Security

Hack-attacks plague the Web

20% of Internet sites have security breaches

One in every five Internet sites has suffered a security breach, according to the 1995 Internet Security Survey by the Computer Security Institute in San Francisco, a membership organization for information security professionals. The survey also reports:

20%

of Internet
sites have
been breached

40%

of Internet
sites don't
have firewalls
in place.

30%

of breaches
occurred after a
firewall was
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Network, client/server group forms

Networking, client/server pros who want to network can do so through a new association

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For information contact Interact, 730 E. Chapman Ave., Orange, Calif. 92666, (714) 997-7966 or fax (714) 997-9743.

Awards

Electronic commerce pioneer Robert Rodin, president and chief executive officer of Marshall Industries, will receive the Annual UCLA Information Systems Associates Award for Executive Leadership.

The award will be presented Oct. 26 at the John E. Anderson Graduate School of Management at UCLA. Rodin will be honored for his "leadership and technology vision" that has led to Marshall's leading position in electronic commerce.

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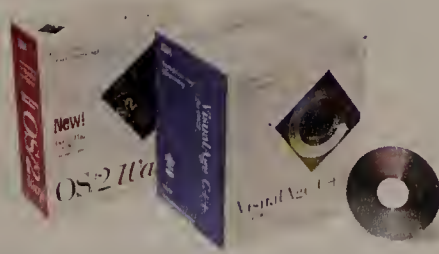
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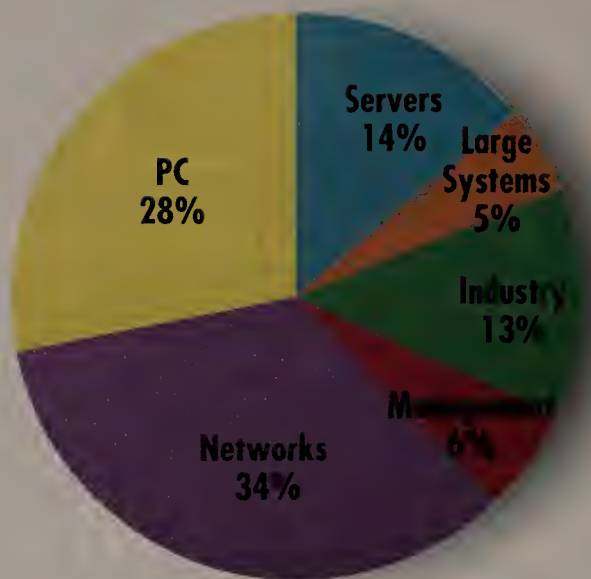
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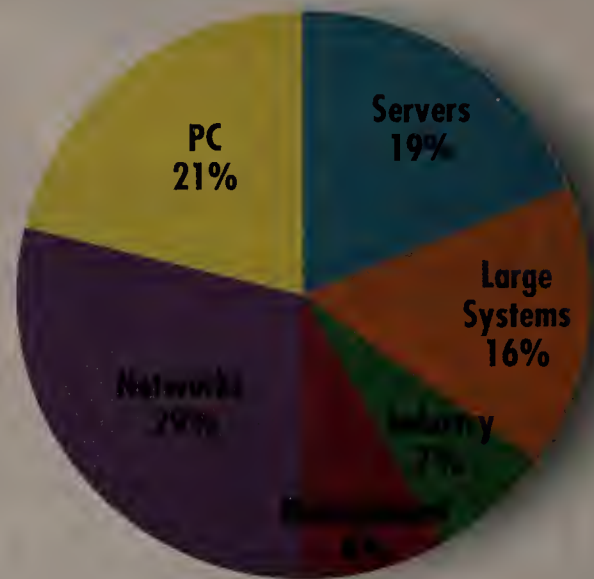
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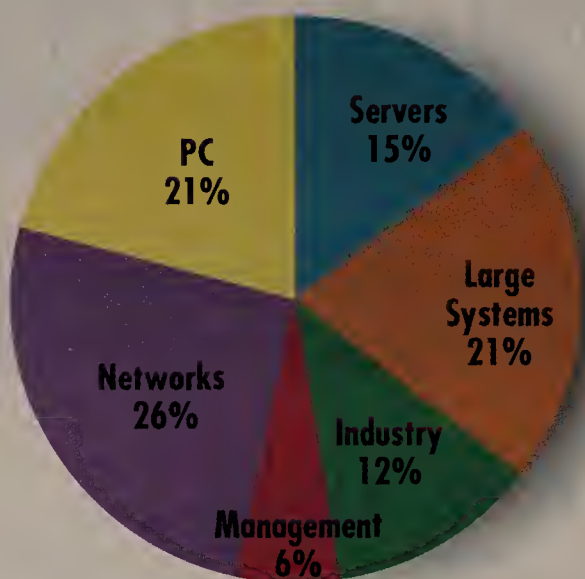
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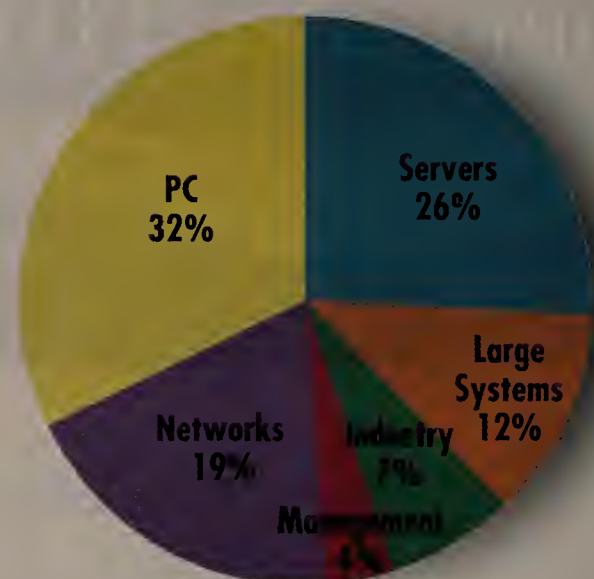
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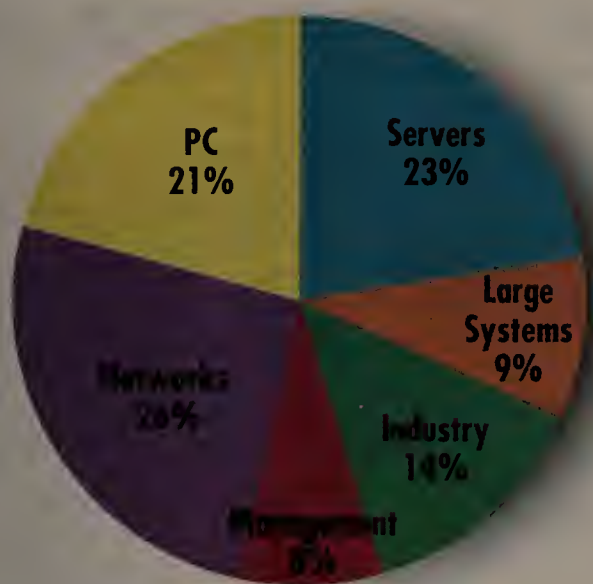
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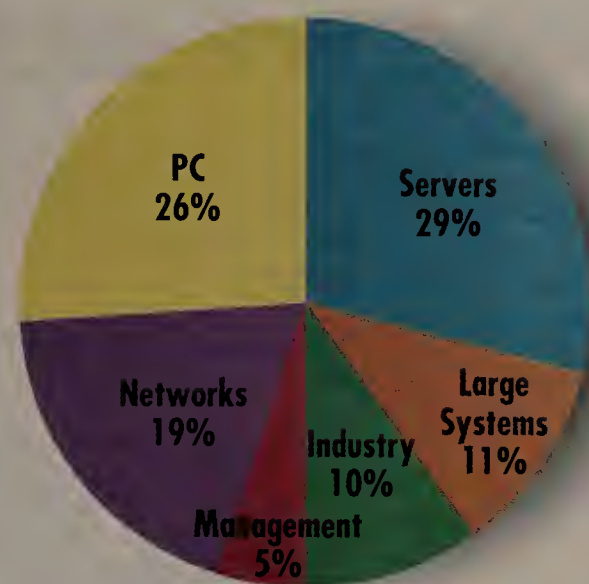
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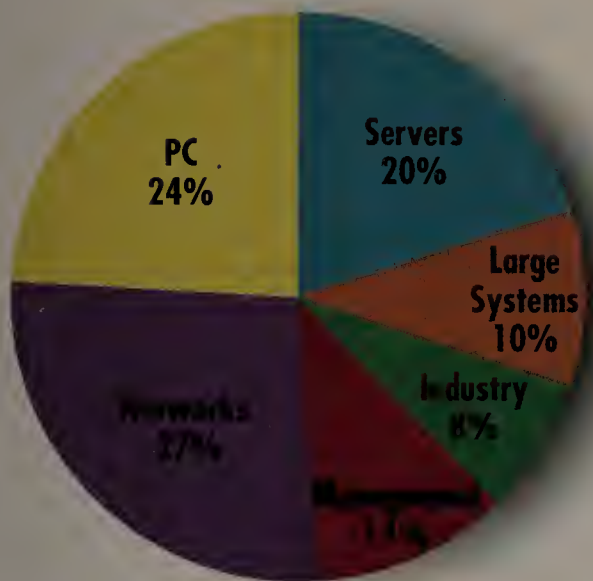
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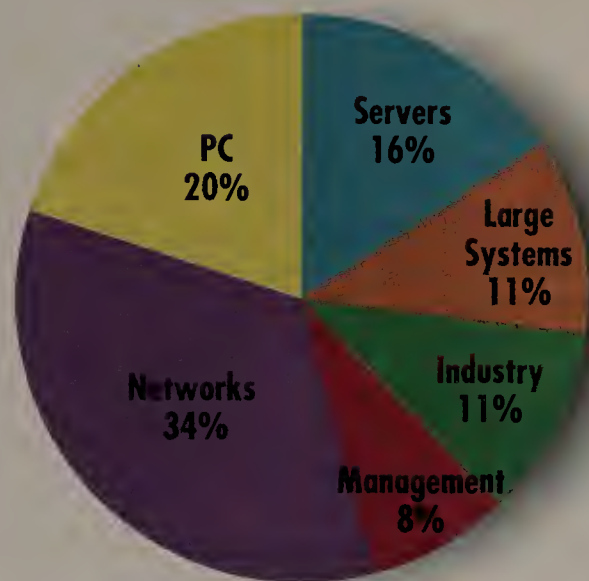
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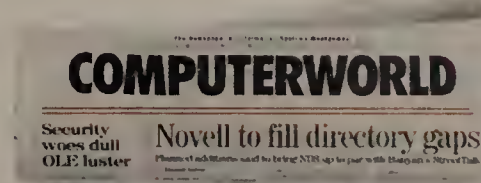
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The Newspaper of IS

MANAGEMENT

Telecommute '95. Santa Clara, Calif., Nov. 7-10

— Topics include: whether telecommuting makes sense for the operation, selecting the right people to telecommute, supervising telecommuters and keeping them involved and informed, choosing the right technology and making it work, integrating new office designs with telecommuting to realize significant space savings and gaining top management approval and support. Contact: Telecommute '95, c/o Incoming Calls Management Institute, Annapolis, Md. (800) 854-0056.

Do Better Deals. Chicago, Nov. 8-10

— Topics include: software, equipment, outsourcing and client/server contracts. Fee: \$1,395. Contact: International Computer Negotiations, Winter Park, Fla. (407) 740-0700.

High Tech Procurement Workshop. Chicago, Nov. 8-10

— Topics include: supplier inner workings, methods, ploys and negotiating gambits. Contact: International Computer Negotiations, Winter Park, Fla. (407) 740-0700.

Women On-line Conference. Washington, Nov. 8-10

— Topics include: How many women are on-line, and who are they?, the women's market in cyberspace, on-line merchandising strategies and safeguarding transactions on-line. Contact: Young & Associates, Inc., Rockville, Md. (301) 309-9404.

Achieving Best of Class: Leading, Managing and Coaching the Modern Software Organization. Washington, Nov. 13-15

— Topics include: risk management, dynamic modeling, making change possible, process improvement and box prototyping. Fee: \$1,095. Contact: Technology Transfer Institute, Santa Monica, Calif. (310) 394-8305.

Communications Managers Association Telecom

1995: 18th Annual Conference & Exposition. New York, Nov. 13-16 — Theme: "Strategies for Connectivity." Focus will be on remote access, international technology challenges and issues, network connectivity and managing more with less. Contact: Talley Management Group, Inc., Woodbury, N.J. (609) 384-2858.

IT Services '95 Conference & Showcase. Washington, Nov. 15-17

— Theme: "Professional Services in Multivendor Environments." Topics include: covering services issues, outsourcing, systems and network integration, consulting and re-engineering. Fees: two-day conference, \$795 (government, \$595); one day, \$495 (government, \$395). Contact: Creative Expos and Conferences, Inc., Walpole, Mass. (508) 660-7099.

Tools & Technology for Self-directed Learning. Scottsdale, Ariz., Nov. 27-30

— Theme: "Innovative, Interactive Training Systems for Boosting Employee Performance." Topics include: self-directed learning and teams, self-managed learning and multimedia/computer-based learning. Contact: International Quality & Productivity Center, Little Falls, N.J. (201) 256-0211.

INDUSTRIES

The Third Color Imaging Conference. Scottsdale, Ariz., Nov. 7-10

— Focus will be on creation, transmission reproduction and display of color images, both traditional and digital. Jointly sponsored by the Society for Information Display and the Society for Image Science & Technology. Contact: Pam Forness, Society for Image Science & Technology, Springfield, Va. (703) 642-9090.

Council for Electronic Revenue Communication**Advancement — Fall Membership Conference.** Arlington, Va., Nov. 9-10

— This conference will update electronic revenue communications stakeholders on the latest advancements in the field. Included are updates by the IRS and other government department officials and industry leaders. Contact: Lisa Karmen, Council for Electronic Revenue Communication Advancement, Chicago, Ill. (312) 644-6610.

Comtrade: The Global Event for Computers and**Communications in Health Care.** Atlanta, Nov. 15-18

— Topics include: computers and communications in health care, computer hardware and software systems, communications networking, electronic bar coding and data interchange. Contact: PAN Communications, Andover, Mass. (508) 474-0055.

USER GROUPS

Open Media Framework (OMF) Interchange International Developers Conference. Colorado Springs, Oct. 23-26

— Focus will be on digital postproduction process and how customers can effectively interchange projects by using OMF-compatible products and applications. Contact: Ariana Wallack, Schwartz Communications, Inc., Wellesley, Mass. (617) 431-0770.

General Magic Developers Conference. San Jose, Calif., Oct. 29-31

— An in-depth look at Magic CAP and Telescript platforms and related market opportunities. Fee: \$495. Contact: General Magic, Sunnyvale, Calif. (800) 468-4342, ext. 4273.

ABUI Fall '95 Conference & Exposition. San Jose, Calif., Oct. 29-Nov. 1

— Theme: "The New Virtual Enterprise." Targets network managers, administrators, support staff and decision-makers. Keynote by Michael Rothman, program director of global networking strategies at Meta Group, Inc. Contact: Association of Banyan Users International (ABUI), Chicago, Ill. (312) 644-6610.

Computron Users Conference. Florham Park, N.J., Oct. 29-Nov. 1

— Keynotes by George Schussel of DCI, Barry Wilderman of Meta Group, Inc. and Brian Sommer of Andersen Consulting. Contact: Computron Software, Inc., Rutherford, N.J. (201) 935-3400.

Comshare North America Users Conference. Nashville, Oct. 29-Nov. 1

— Theme: "Ideas in Motion." Keynote by Don Tapscott, co-author of *Paradigm Shift: The New Promise of Information Technology*. Contact: Comshare, Inc., Ann Arbor, Mich. (800) 489-7551.

TECHNOLOGIES

Wireless World Expo '95. San Francisco, Nov. 7-9

— Theme: "Customer Care: The Great Differentiator." Topics include: shared network techniques, wireless LANs, bridges and links, wireless location strategies and reaching the mass market. Fee: \$395. Contact: E. J. Krause & Associates, Inc., Bethesda, Md. (301) 986-7800.

Video & Chat. Washington, Nov. 9-10

— Topics include: sizing up the interactive entertainment marketplace, interactive entertainment platforms, interactive games, interactive gambling and interactive video/advertising. Fee: \$895. Contact: BRP Publications, Inc., TR Conference Department, Washington, D.C. (202) 842-3022.

National Conference on Merging Your Organization onto the Internet: Successful Implementation. Arlington, Va., Nov. 13-16

— Sponsored by the Washington Chapter Internet Society, Association of On-line Professionals and Capital PC Users Group. Contact: U.S. Professional Development Institute, Silver Spring, Md. (301) 445-4400.

PowerTesters. Orlando, Fla., Nov. 13-17

— Focus is on ways people are solving tough testing problems and concentrating on practice. Contact: Quality Assurance Institute, Orlando, Fla. (407) 363-1111.

Comdex/Fall '95. Las Vegas, Nov. 13-17

— Topics include: management strategies, business on the Internet, multimedia, distributed computing, the changing desktop, network infrastructure, wireless and mobile computing, technology fundamentals, business process re-engineering and outsourcing. Contact: Softbanks Comdex, Inc., Needham, Mass. (617) 449-6600.

The 7th Annual Open Systems World/FedUnix Conference and Trade Show. Washington, Nov. 13-17

— Conference consists of nine major programs, including the Unix Network Security Conference, Open Data Warehousing Conference, Open Client/Server Solutions Conference, Motif '95-International Motif/CDE Users Conference, Internet/WWW from A-Z Conference, Linux International Users & Developers Conference, Creating the Electronic Government Free Conference, Federal Leadership Awards and Taste of SCO Forum. Contact: Jennifer Kinloch, Open Systems World, Inc., Columbia, Md. (301) 596-8800.

Faxworld '95. San Francisco, Nov. 29-Dec. 1

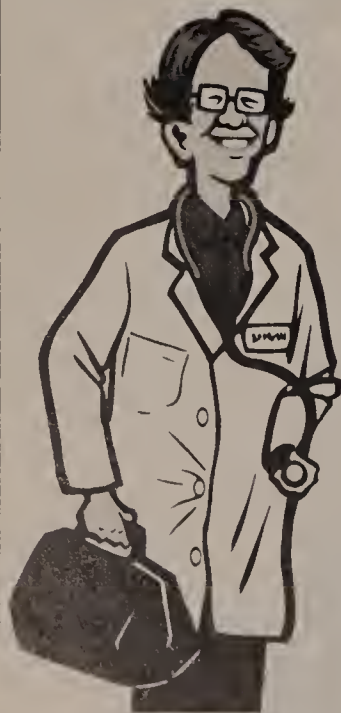
— Focus is on helping information systems and communications professionals who are utilizing or implementing fax-integrated messaging technologies in their organizations. Keynotes by Chris Roeckl, executive editor of *Communications Week*, on "A Vision of an Integrated Communications Strategy" and Mark Skapinker, president of Delrina Corp., on the "Future of Fax Software." Fee: \$995. Contact: Customer Service at BIS Strategic Decisions, Norwell, Mass. (800) 874-9980.

Calendar announcements should be submitted at least six weeks prior to the event and include the title of the event, dates, location, theme or focus, keynote or major speakers, principal topics and a contact person, organization and phone number.

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NOS metamorphosis

New roles emerge for network operating systems; Windows NT, NetWare go head-to-head

Under its traditional definition, a network operating system is the software that connects PCs and manages networked resources so that things will run smoothly. Now you can forget that definition because the networking world is changing every day.

Enterprise network operating systems are evolving beyond the old parameters: They're more scalable; they communicate more easily over multiple protocols; they offer extensive security features because the system handles geographically dispersed networks; they're allegedly more reliable; and they offer — or at least are making an effort to offer — directory services to improve the interoperability of directories in operating systems and applications.

Further, in a field once dominated by Novell, Inc.'s NetWare, we're seeing Microsoft Corp.'s Windows NT Server make astonishing strides. According to a recent *Computerworld* survey, managers are willing to pay salary premiums for NetWare expertise but will pay even more for NT skills. In a lab test con-



ducted for *Computerworld* by The Tolly Group, NT Server takes the ribbon in most performance categories. Overall, NetWare and NT Server each have strengths, so read carefully and keep in mind which features and functions are important to your environment. See "Putting NT Server and NetWare to the test," page 106.

In our Buyers' Satisfaction Scorecard, conducted by First Market Research, 50 users of each of the top network operating system products — NetWare, Windows NT, Banyan Systems, Inc.'s Vines and IBM's LAN Server — rated their satisfaction in five critical categories. While overall performance scores for each product

were strong, NT again held an edge in many areas. See page 113.

Computer Intelligence InfoCorp senior analyst Paul Zagacki predicts that global directory services and desktop management technology will have a major impact on future network operating system versions. See Sneak Peek, page 110.

Finally, because we can always learn from others' experiences, IS managers share how they selected their NOS. See page 110.

Putting NT Server and NetWare to the test

NT Server and NetWare match up on features and third-party support; NT gains an edge in performance

By Kevin Tolly, John Curtis and Karl I. Metzelaar

HOW THE TOLLY GROUP DID IT

Our test evaluated core network operating systems functions, enterprise add-ons and system performance.

Per-seat software costs weren't considered in this analysis because both vendors are likely to adjust prices to keep those numbers as competitive as possible. For this comparison, we combined research, interviews with vendor experts and actual hands-on evaluations of the network operating systems and various third-party add-on products.

SERVER

Dell Computer, Inc.
Power-Edge SP 590-2
CPU: Dual 90-MHz Pentium
Memory: 64M bytes
Bus architecture: PCI, EISA
Hard drive: Dual 1G-byte SCSI
Software: NetWare 4.1
NT Server 3.50 and
Lotus Notes 3.30 (NetWare and Windows NT versions)

CLIENTS

4 Dell Dimension XPS P60s
CPU: 60-MHz Pentium
Memory: 8M bytes
Bus architecture: PCI, ISA
Hard drive: 540M-byte IDE
Software: Windows for Workgroups 3.11

NETWORK

Network Interface Card: Fast EtherLink PCI 10/100Base-T
Concentrator: 3Com Corp. FMS-100 Fast Ethernet Concentrator
Cable: Four-pair UTP

More than a decade after the introduction of Novell, Inc.'s NetWare, many network managers are still trying to decide which network operating system to choose: NetWare or Microsoft Corp.'s NT Server.

By running tests in three key areas — core system functions, enterprise add-ons and performance — The Tolly Group, an information technology testing organization, was able to identify and quantify some areas where clear differences exist.

Our tests indicate that overall it's a toss-up between NetWare and NT in core functionality and availability of enterprise add-ons. But NT's ability to match NetWare in these areas is something of which Microsoft should be proud. In limited performance benchmarking, which included file and application services at a workgroup scale, NT bested NetWare in five of six scenarios, although NetWare was unable to take advantage of our dual-Pentium server like NT did.

This by no means suggests that NT will take over the network operating system market. But it does mean NT has taken its place as a viable alternative to NetWare.

TEST NO. 1

CORE SYSTEM FUNCTIONS

No surprises here. By now, most of us are familiar with points each vendor touts about its network operating system. For example, Novell's NetWare Directory Services far surpasses what NT has to offer with its current domain-based management scheme. And, for the moment at least, NetWare seems to have the upper hand on security (see related story, page 108).

When it comes to portability and, to a large extent, scalability, NetWare pales in comparison with NT's microkernel approach, which already allows NT to run "natively" on non-Intel Corp. processors. In addition, NT already supports symmetrical multiprocessing (SMP) systems, while Novell only recently announced an SMP strategy based on partnerships with third-party suppliers. The lack of SMP support in NetWare at the time the test was conducted may be one reason why NT outperformed NetWare in our benchmarks.

The internal architectures of the systems are as different as night and day. NetWare offers a purpose-built operating system that doesn't support virtual memory or pre-emptive multitasking. Novell maintains that this type of system is required to deliver good performance.

In stark contrast, NT is a "standard" operating system that uses multitasking and virtual memory to run multiple

tasks simultaneously. Under NetWare, most third-party products — implemented as NetWare Loadable Modules (NLM) — run as privileged processes, have access to the "heart" of the system and could crash the server at any time. With NT, all application programs run in a special "user" mode. If that program goes beyond its bounds, the operating system will terminate it before it causes any harm.

We prefer the standard approach over the proprietary, especially if it seems to perform as well or better than the proprietary alternative. Further, it is no doubt much easier for third-party vendors to hire designers and programmers skilled in the Win32 application programming interface and architecture than it is for them to find experts in building NLMs. In many cases, that vendor already has built a version of the application for Windows NT and/or Windows 95 environments that can become the basis for the server program.

Conclusion: Given the preferences of different network managers, you can call it a draw in core functions.

TEST NO. 2

ENTERPRISE ADD-ONS

Here we move deeper into the more sophisticated functions of special interest to enterprise environments. We identified a number of key components and looked at products from network operating system vendors and

third-party vendors.

Our goal was twofold: To determine if the offerings for one system far outnumbered the other and to determine if, when using like products, the internal architecture of the system would have any obvious effect on the richness of function. Because of the large number of products and the likely interdependencies that existed, only minimal spot-checking was performed.

The news, on paper at least, is all good. We compiled information on backup, SNA access, virus protection, remote access and uninterruptible power supply systems. And for fun, we threw in a World Wide Web server. Except in the case of the Web server, we found multiple brand-name offerings for each operating environment. The Web server also was the only product area in which we failed to find a NetWare offering.

In many cases, the same vendor offered functionally identical products for NetWare and NT. American Power Conversion's PowerChute, software that protects systems during power failures; Cheyenne Software, Inc.'s InnoeuLAN, virus protection software; and Lotus Development Corp.'s Notes groupware software are good examples. As described below, the differences between the NetWare and NT versions are trivial at best.

Conclusion: The choice of base network operating systems doesn't determine or limit the choice among applications and vendors. So again, a toss-up.

PRODUCT PROFILE

NETWARE

NetWare is a file and print server network operating system optimized for I/O operations but capable of supporting application services through NetWare Loadable Modules (NLM). NetWare offers excellent security through packet signatures and public encryption key technology.

NetWare doesn't include what some might consider key application server functions such as pre-emptive multitasking or virtual memory. Novell maintains that virtual memory is unnecessary in a dedicated server and that the NetWare operating system is optimized in such a way that multitasking would hinder performance.

While this deficiency might seem to weaken NetWare in the client/server application arena, NetWare's market maturity has led a large number of developers to produce off-the-shelf client/server application platforms for NetWare based on NLMs.

WINDOWS NT SERVER

Windows NT Server appears to have been designed as an application server platform, albeit with file and print services similar to those of NetWare. Unlike NetWare, in which the server is dedicated to specific functions, the NT Server acts as an NT workstation and a server.

NT users can perform all necessary NT tasks at the server. NT Server includes SMP support (up to 32 processors, with the greatest performance increase occurring with the move to two processors), pre-emptive multitasking and virtual memory. It also was built on a microkernel architecture to make it inherently more fault-tolerant.

While NetWare is primarily aimed at Intel PCs, NT Server is compatible with a broader range of high-end servers, including PowerPC, Digital's Alpha and Mips Technologies, Inc.'s workstation platforms.

Other issues to consider:

- NetWare's file and print services appear as a transparent extension of standard client operating environments, which makes it relatively easy to replace NetWare redirectors with equivalent software to access NT Server.
- NT Server requires rebooting for most changes, including network adapter drivers and protocol bindings.
- NT Server requires a full reinstallation to change the domain name.
- NetWare requires a network workstation to perform most server tasks.
- Early SMP support for NetWare will be through authorized resellers only.

TEST NO. 3

SYSTEM PERFORMANCE

NetWare is first and foremost known as a high performer in the realm of traditional file services. NT, on the other hand, is most often thought of as an application server platform that also can deliver traditional file and print services.

For our performance samples, we wanted to make certain that we exercised both types of functionality, although the tests were done on a limited-scale basis using four clients.

One might have expected NetWare to prevail in the file server portion and NT in the application handling. What occurred was a surprise. In an evaluation of pure file services using standard Microsoft Windows for Workgroups clients, NT completed both the upload and download functions using a 50M-byte file almost twice as quickly as the NetWare server did. The IPX protocol was used for NetWare, the NetBIOS protocol for NT. Score one for NT.

In an evaluation of Notes that combined file and application services by calling for a Notes-controlled database copy, the results were mixed. NT executed the outbound copy (from server to client) more than twice as fast as NetWare did. From client to server, however, NetWare finished the job in less than half the time of NT. This was the only scenario in which NetWare won on performance.

This portion of the performance test was a draw.

Finally, we used a server-executed

function, a Notes full-text indexing process, to compare effective application processing speeds. Almost no traffic flows across the network. When indexing a single database or even four queued databases, NT finished first by a significant margin.

It may be that NT's ability to take advantage of the two processors made it a "no contest." Whatever the reason, these samplings of performance indicated that NT is no slacker.

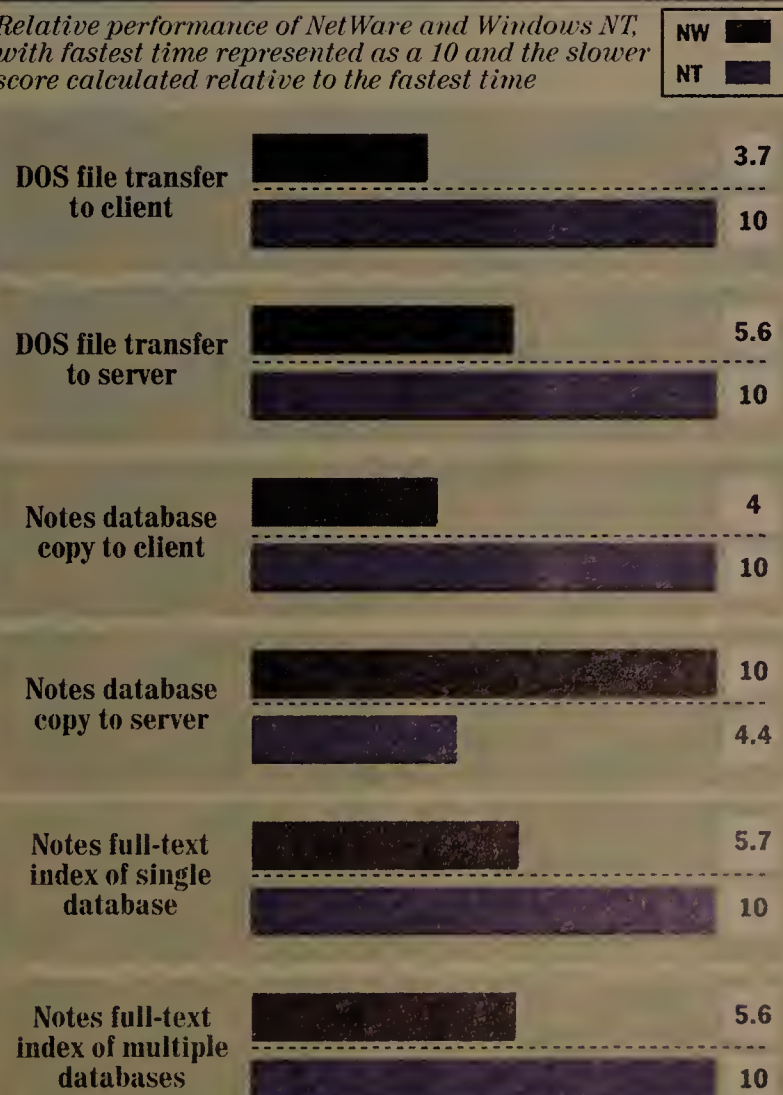
After we conducted this test, Novell announced support of SMP. That feature would likely have resulted in better performance results for Novell. However, even now, they are still months behind NT because only OEMs are offering the SMP support, which may indicate that Novell's "old" architecture is experiencing a difficult evolution.

Further, we ran the performance portion of our evaluation with NT Server 3.50 because hardware incompatibilities during installation prevented us from running Version 3.51 in time for this test. Our Dell Computer Corp. PC suffered from an incompatibility in which the Peripheral Component Interconnect bus would not operate properly when running NT Server 3.51. (Dell is aware of the problem.) Therefore, we used NT Server 3.50 for the performance portion of the evaluation. Microsoft claims that 3.51 offers significant performance improvements over NT 3.50.

Tolly, Curtis and Metzelaar are affiliated with The Tolly Group, an information technology testing organization in Manasquan, N.J.

NetWare 4.1 vs. Windows NT 3.5 performance comparison

Relative performance of NetWare and Windows NT, with fastest time represented as a 10 and the slower score calculated relative to the fastest time



Scores have been rounded

Piece by Piece

NetWare and NT define their own areas of strength

DIRECTORY SERVICES

NetWare 4.1's NetWare Directory Services (NDS) incorporates a single directory database, which may be replicated, for all resources and all clients. Through centralized directory services, a user, server or application can access another resource on the network independent of that resource's location. NetWare provides customization of network objects among 14 categories.

Microsoft's Windows NT, although often thought of as a departmental network operating system, is also designed for larger networks. Interdomain resources are available only through server-to-server communications via what Microsoft calls "trust relationships," but such domains are in many ways equivalent to Novell's network partitions.

There are important differences between the two approaches. NetWare partitions remain aware of the others' existence, while NT Server domains remain unaware of one another until trust relationships are established. Novell sees automatic partition awareness as an advantage for administration; Microsoft considers domain privacy a security benefit. Another distinction is that NetWare supports multiple partitions within a single server, whereas NT servers can belong only to a single domain.

NT Server is limited in its directory structure because directory objects are either users or devices, while NetWare supports 14 object types. However, both are extensible. Microsoft's Open Directory Services Interface, an Open Database Connectivity interface, supports directory services across multiple directories. Novell, through its Novell Directory Assistance Partners, can provide application programming interfaces for extending NDS objects, and a number of third-party developers have already built such APIs.

In summary, organizations whose departments are generally independent and whose management scheme is departmentally autonomous will fare better with NT's domain-based directory scheme; organizations requiring a single, central point of management for the enterprise will fare far better with NDS.

FAULT TOLERANCE

NT Server is built around a microkernel architecture and provides a level of protection for the operating system. NetWare's Netware Loadable Modules — both those provided in the operating system and in third-party applications — operate in Ring 0, the level at which processes are most tightly integrated with the operating system, and Novell continues to maintain a list of Netware 4.1-compatible applications. Such applications must support an optional protected domain operation in which the user can specify operation in Ring 3 to prevent any disruption to server operation. However, operation in Ring 3 yields lower performance and, Novell would contend, is one reason protected operation can reduce server performance on any platform.

Another important consideration is the operation of the network during server/controller fail-

ure. If a primary controller in an NT server fails, promoting the secondary controller to the role of primary controller requires manual intervention. While this isn't a lengthy process, it does require the availability of the network administrator. In NetWare 4.1, by contrast, the activation of a backup server is automatic.

SECURITY

NetWare 4.1 includes several security features. NetWare 4.x's NDS uses RSA Data Security, Inc.'s public encryption key technology. NetWare Core Protocol uses packet signatures to prevent packet forgery. NetWare is currently under application for the so-called Red Book certification with the National Computer Security Center.

NT offers no packet signature security. However, it does use Challenge Handshake Authentication Protocol during log-in to prevent passwords from traversing the network. (NetWare sends passwords across the network, albeit in encrypted format.) Contrary to press reports, Microsoft has applied for both Orange Book and Red Book C-2 certification. The former has been issued and the latter is under way. However, this certification applies only to NT Server and NT Workstation and therefore doesn't apply to other client platforms such as DOS or Windows. Novell's certification, on the other hand, applies to the overall architecture and is therefore more comprehensive.

Microsoft's NT Server documentation suggests not setting a password for some network services. However, following this advice will mean that unscrupulous users could access these unsecured processes. During discussions with The Tolly Group, Microsoft suggested that security-conscious network administrators set these passwords to prevent disruption of network activity.

CLIENT CONNECTIVITY

Both NetWare and NT Server support DOS, Macintosh, OS/2, Windows for Workgroups and Windows NT clients. NetWare also supports Unix clients. For peer-to-peer networking, NetWare provides Personal NetWare, while NT Server supports Windows for Workgroups and Windows 95. — *The Tolly Group*

Vendor response

Microsoft told *Computerworld* that Novell's security certification will be less comprehensive because it is based only on network-oriented NetWare functions and a single third-party client. It also said NT is designed "to be as secure as you want it to be."

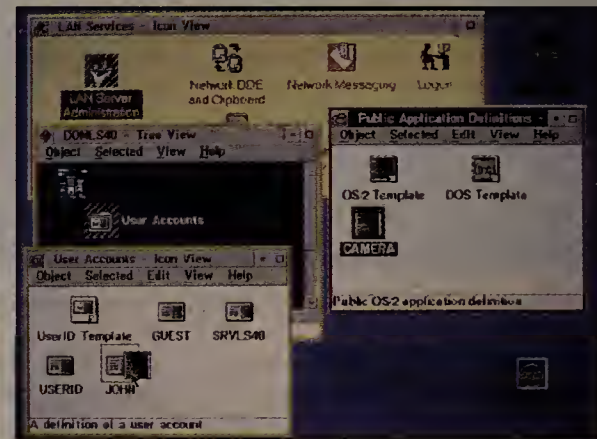
Novell officials questioned the performance tests, noting that NetWare typically outperforms NT in file services. Novell told *Computerworld* that NT should have been tested on a single-processor system and suggested that the use of any cache on the client systems could unfairly favor NT.

SNIPPETS

A sampling of comments from technical reviews of network operating systems.

■ "Netware 4.1 has the strongest security and messaging integration. Reliability is good, although application services are only fair. NetWare's biggest advantage may be its market dominance, which results in strong third-party support. LAN Server 4.0 has the most powerful application services, but its directory services are weak. Banyan's Vines is known for its powerful directory services and is good in most other areas. . . . NT Server, which has powerful application services, is emerging as the platform of choice for many single-NOS enterprises." — *Data Communications*, May 21, 1995

■ "LAN Server 4.0 is up to par with the leading [network operating systems] in almost all categories of importance. The major drawback to this release of LAN Server is that it still lacks a global naming system, such as Banyan's StreetTalk or Novell's NDS. But IBM has beefed up LAN Server's domain support, so you can build large, multiserver networks. — *LAN Magazine*, March 1995



LAN Server scores well in categories such as administration

■ "Chief among Banyan's enhancements to Vines 6.0 are guaranteed log-in through StreetTalk shadowing, highly leverageable distributed [Simple Network Management Protocol] Version 2 support, improved (although still not great) backup/restore options and a configurable kernel." — *PC Week*, June 26, 1995

■ "Installation and configuration was a clear win for Microsoft Windows NT Server. . . . Among its greatest strengths is its ability to auto-detect and then appropriately configure itself for whatever peripherals, adapters and controllers are installed in the PC server. Another notable plus for NT Server includes support for symmetric multiprocessing." — *Communications Week*, June 19, 1995

■ "Of the differences between NetWare 3.x and NetWare 4.1, [NetWare Directory Services] is the one that matters if you want easier network administration. NDS is an X.500-like, global, distributed directory service. . . . But NDS is not simple. Creating an optimal directory structure for a large, worldwide network will require extensive planning and practice." — *PC Week*, May 30, 1995

■ "Evolutionary is the best way to describe Vines 6.0. . . . The package is imbued with enough new features that current Vines shops should consider the upgrade. Organizations not ready to abandon their network operating system but looking for directory services to decrease administrative overhead may want to investigate Banyan's Enterprise Network Services." — *PC Week*, June 26, 1995

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GLOSSARY

Network operating system — A multiuser operating system that manages network resources. It manages multiple requests concurrently and provides the necessary security.

Enterprise network operating system — Software that provides the means for sharing resources over a geographically dispersed network in one organization.

Client/server — The architecture around which network operating software is designed. A portion of the network operating system resides in each client machine and server. The client portion handles client requests for data; the server portion handles processing and the I/O to clients, other servers or shared network devices, such as printers, fax machines and modems.

Connectivity — The ability of a network operating system to simultaneously communicate over multiple protocols.

Resource sharing — The ability of users to share all resources, such as printers, modems, applications and files.

Sources: Paul Zagaeski, Computer Intelligence InfoCorp; *Understanding Local Area Networks* by Stan Schatt, SAMS Publishing, 1993; *The Computer Glossary*, Seventh Edition, by Alan Freeman, The Computer Language Co., 1995.

QUOTES

IS managers who have recently purchased or upgraded their network operating systems had the following comments:

"At the time we did the evaluation, we chose NetWare for the enterprise. The three major reasons were NDS, tools that allowed us to centrally manage a worldwide network and because it was a cost-effective solution. Other reasons were the security functionality and the abundance of application providers.

— *Paul Schuler, director of server technology at The Mead Corp. in Dayton, Ohio*

"We decided to switch from Novell, so we considered Sun, Digital, IBM AIX, Microsoft Windows NT Server and other Unix operating systems. We needed additional services and wanted to be cross-platform using TCP/IP. Microsoft Windows NT Server came out on top because it was a cost-effective solution. Also, it provided ease of management and worked with our hardware." — *Michael Aday, manager of research and development at Quad/Graphics, Inc. in Pewaukee, Wis.*

OS/2 "is easy to install and it doesn't crash. We use Windows NT Server for some Web servers and they crash frequently. AIX and OS/2 are more reliable." — *Jim Flannery, wide-area network systems engineer at MCI Telecommunications Corp. in Englewood, Colo.*



"There is no such thing as a single vendor anymore. The important thing is interoperability. Banyan has always done this well." — *Tim Gilkarson, director of global network operations, The Gallup Organization in Lincoln, Neb.*

"Determine the size of your network, the number of users and the types of applications. Pick a system that allows you to work now and grow in the future. Also, your protocol method, wiring scheme and method of communications should all be considerations." — *Michael Swearingen, lead software analyst at Lee Apparel Co.*

Sneak Peek

By Paul Zagaeski

Network operating system outlook 1: Proven global directory services

The great thing about networks is that users can access data and resources anywhere in the enterprise (or the world, via the Internet). The lousy thing about networks is that you can't find what you want.

A global directory service can provide a live list of network-related things — such as computers, printers, servers, applications and documents — and a list of users, buildings and noncomputer devices such as video projectors — anything users might need to know about or use.

It's inefficient, for example, to maintain separate enterprise directories for file servers (which list servers, disk directories and documents), electronic-mail systems, human resources databases and applications such as shared calendars. These directories all share some common information but can't be managed as a common resource.

Microsoft, Novell, Banyan and others have proposed various flavors of global directory services intended to act as a "table of contents" for corporate and/or public networks. These schemes and/or products are based on the X.500 standards for directory services. They are in the market now or are about to be introduced, and will be key to advancing the usefulness of enterprise and interenterprise global networks.

Banyan has even floated the idea of creating a global directory service for the Internet, with hundreds of millions of data elements. Intriguing, but is it practical?

Network operating system outlook 2: Desktop management technology

A continuing flaw in client/server computing is that desktop computing systems, being primarily controlled by individual users, can't reliably hold up their part of the client/server structure. They crash, their hard drives lose data, and they even disappear from the network (if they're portable).

To create more robust management for desktop systems, some vendors have contributed to the Desktop Management Task Force (DMTF), whose main goal is to create the Desktop Management Interface (DMI), a set of standards for monitoring and managing desktop computers.

This effort has affected hardware and software system design, network operating systems, management applications and even the philosophy of independent PCs vs. centrally controlled information systems. Most IS folks want better control of desktop "assets," but at what price?

When the rumor began that Windows 95 installation software would collect data from the PC on which it was being installed and report it back to Microsoft, angry users suggested that Big Brother was descending on the world of personal computing. The DMTF has to cope with polar attitudes about personal vs. organizational computing as it creates a scheme to manage the components of client/server systems.

Zagaeski is a senior analyst at Computer Intelligence Infocorp in Boston.

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|-------------|----------------|
| (a) Solaris | (e) Mac OS |
| (b) Netware | (f) Windows NT |
| (c) OS/2 | (g) Windows |
| (d) Unix | (h) NeXTstep |

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| (d) Unix | (h) NeXTstep |

App. Development Products ☐ Yes ☐ No

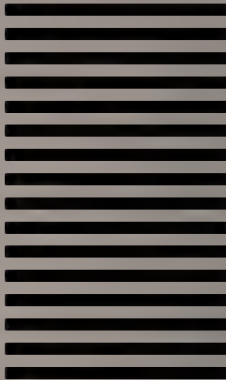
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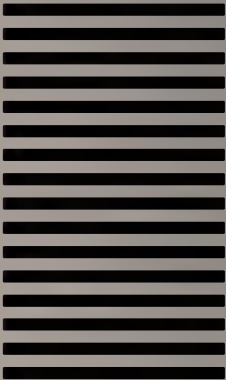
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Buyers' Scorecard: NT Server takes lead

By Kevin Burden

Microsoft Corp.'s Windows NT Server doesn't have the same market seasoning or as many revisions as Novell, Inc.'s NetWare, Banyan Systems, Inc.'s Vines or IBM's LAN Server, but that didn't stop NT from becoming the darling in this Buyers' Scorecard.

In three out of five categories — performance, reliability and systems management — more NT Server users gave ratings of “good” or “very good” than any of its competitors. In the directory services category, NT was barely beaten by the StreetTalk directory in Banyan's Vines.

Computerworld hired First Market Research to ask 50 users of each of the top network operating systems to rate their satisfaction in 28 categories. The review is based on the five categories historically critical to network operating systems.

Ease of use partially explains NT Server's success, according to Rob Enderle, senior analyst at Dataquest, Inc. in San Jose, Calif. NT Server is every bit as powerful as NetWare, Vines and LAN Server, he says, but NT has exceptional on-line help, a directory structure that lets administrators organize environments into logical groups and one of the best client-to-server interfaces for Windows NT Workstation clients.

“NT [Server's] approach to common functionality may differ from the others,” says Enderle, referring to NT's domain directory and data replication features. “But it's easy to learn and use, and that helps at satisfying users.”

Overall performance scores for the four network operating systems are strong, reflecting satisfaction with overall functionality. NT holds a slight edge when combining the “good” and “very good” responses. LAN Server comes in second in overall performance, followed by Vines and NetWare.

Directory services

Banyan's strong directory services got only stronger in Releases 5.5 and 6.0; 80% of Banyan's users gave favorable grades to StreetTalk III, with many saying it's the easiest directory to understand and manage.

NT Server's Domain Naming Service had the second-highest number of users awarding favorable grades. NT's domain approach differs from the hierarchically organized directories that Banyan and Novell use in that it lets managers group users and re-

sources into logical domains. Its drawback is that each domain needs to be managed individually through the network's primary domain controller, which can make administration tedious, according to users.

IBM's LAN Server also uses a domain directory that 65% of its users approved. While that shows respectable user support, it doesn't match the enthusiastic backing Microsoft received.

In a related question on directory design, Novell's hierarchical approach received favorable grades from 62% of NetWare users. But while Banyan scored nearly 20% higher for overall directory services, several Novell users said the tools for making changes were much improved in NetWare 4.1.

Reliability

Nearly the same number of users gave each system favorable ratings for reliability. IBM, Microsoft and Banyan each had more than 70% of its users giving favorable grades, and NetWare had just over 60%. More than half of the 60% gave NetWare “very good” grades.

All of the systems support some form of replication in which databases or entire servers are mirrored in case one goes down.

NetWare automatically copies the NetWare Directory Services database to back up servers during installation, and it synchronizes mirrored servers for redundancy.

Replication is new in Banyan's Vines 6.0. Users with 6.0 said it works well, but shadowing is only possible between Vines 6.0 servers and not Vines 5.5 servers.

Several NT Server users focused on NT's reliability as an application server. NT's 32-bit pre-emptive multitasking, multi-threaded, multiprocessor environments makes it “the most reliable server for running applications,” one user said.

Systems management

NT Server users again put Microsoft ahead of its competition — this time way ahead. Its strengths, according to users, are its alerting and thresholding, Simple Network Management Protocol agent implementation and the ability to centrally manage multiple servers. Although the utilities for some of the management functions ship separately in the NT Server Resource Kit, users didn't say that was a problem.

IBM, Banyan and Novell finished nearly equal in the systems management ratings, although LAN Server held a slight edge in the number of users giving “very good” scores. The three were just as equal in case of administration, in which all had slightly more than half its users giving favorable scores.

LAN Server users giving high grades said its domains go a long way toward simplifying management. “You don't need to crowd the screen with information you don't need,” one user said.

Several Novell users pointed to NetWare's NWADMIN interface, a new feature in NetWare 4.1, as one of its best strengths in this category. The interface lets administrators change network parameters through simple drag-and-drop commands. Other users said they would have given higher scores if Novell bundled ManageWise, its management software suite. ■

Burden is *Computerworld*'s senior researcher, Firing Line/Scorecard.

USERS' EVALUATIONS

200 users rated their network operating systems. Vendors are listed in order of total favorable ratings. Percentages are based on the responses of 50 users per vendor.

OVERALL PERFORMANCE

	Good	Very good
Microsoft	52%	26%
IBM	46%	27%
Banyan	55%	16%
Novell	38%	22%

DIRECTORY SERVICES

	Good	Very good
Banyan	43%	37%
Microsoft	44%	34%
IBM	46%	19%
Novell	42%	20%

OVERALL RELIABILITY

	Good	Very good
Microsoft	30%	46%
Banyan	33%	41%
IBM	42%	29%
Novell	25%	36%

SYSTEMS MANAGEMENT

	Good	Very good
Microsoft	36%	34%
Banyan	33%	18%
Novell	35%	16%
IBM	29%	21%

SERVICE AND SUPPORT

(averages of nine separate support categories)

	Good	Very good
IBM	18%	15%
Banyan	17%	12%
Novell	12%	11%
Microsoft	17%	6%



Support, cost idiosyncrasies

In this scorecard, all four vendors received mediocre scores when averaging nine support categories, but each had its bright spots. Microsoft scored well for its response to general inquiries but was dismal at emergency response. Versatility is Banyan's strength. IBM's emergency response was above all others, and Novell's best score was for its support staff's knowledge.

The word on costs is that acquisition is livable, but maintenance costs are only bearable. Ratings for maintenance cost satisfaction averaged 12% lower than ratings for purchase price.

Computerworld Editorial Calendar

Nov. 1995 - Jan. 1996

Issue Dates	Ad Closings Color* B&W		Editorial Features & Custom Publications	Show Distribution & Ad Readership Study Issues	
Nov.	Sept. 27		Computerworld Client/Server Journal Vertical Market Focus: Brokerage Section Feature: Product Focus on Development Tools	Comdex Fall Mobile World Client/Server World DB Expo	Harvey Study
Nov. 6	Oct. 20	Oct. 27	CW Guide To: Object-oriented DBMS and Development Tools Is object-oriented the next wave in DBMS or is it an embedded technology that will gradually simply add functionality to present offerings? This question and how it affects IS buying decisions will be examined. Buyers' Satisfaction Scorecard: Market leading object-oriented DBMS Firing Line: Latest object-oriented DBMS from a leading vendor		Starch Study
Nov. 13	Oct. 27	Nov. 3	CW Guide To: Desktop PCs Pentium, PowerPC and other platforms will be examined with regard to the migration issues and performance gains they provide. Buyers' Satisfaction Scorecard: Market leading desktop PCs Firing Line: Latest desktop PC from a leading vendor	Comdex Fall Las Vegas 11/13 - 11/17	
Nov. 20	Nov. 3	Nov. 10	Special Report: Electronic Commerce		
Nov. 27	Nov. 10	Nov. 17	Closer Look: Internet Browsers	Mobile World Boston 11/28 - 11/30	
Dec. 4	Nov. 17	Nov. 22*	Closer Look: Visual Development Tools	Client/Server World Chicago, 12/5 - 12/7 DB Expo New York City, 12/5 - 12/7	Starch Study
Dec. 11	Nov. 22*	Dec. 1	CW Guide To: Messaging Software and E-mail With e-mail going through a major architectural change to client/server, the market will have a very different shape. IS should be able to purchase products that better address company needs. Buyers' Satisfaction Scorecard: Market leading e-mail software Firing Line: Latest e-mail package from a leading vendor		
Dec. 18	Dec. 1	Dec. 8	Closer Look: Contact Management Tools		
Dec. 25 - Jan. 2	Dec. 8	Dec. 1	Annual Forecast Issue: Choices abound for IS managers in 1996, but the budget and the workday will stretch only so far. Computerworld will draw on the expertise of users and industry figures to help the IS manager solve the mystery of where to invest in 1996 Special Section: Jobs Preview 1996		
Jan. 8	Dec. 15	Dec. 29	Closer Look: Storage Management		
Jan. 15	Dec. 29	Jan. 5	Buyers Guide to Notebook Computers: A look at technology directions in portable computers, tips for evaluating notebooks and an analysis of the strengths and weaknesses of leading notebook product lines.		Starch Study
Jan. 22	Jan. 5	Jan. 12	Special Report: The Best Computer Science and IS Schools		
Jan. 29	Jan. 12	Jan. 19	Buyers Guide to Network Management: How do today's network management packages meet corporate needs, and how will those products and corporate requirements evolve in tomorrow's distributed computing environment? What features should buyers look for, and how do products compare with each other?	ComNet Washington, DC 1/30 - 2/1	

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Editorial contacts (508) 879-0700: Annual Forecast Issue: Paul Gillin, Closer Look: Johanna Ambrosio, Buyers Guide: James Connolly, Hot Happenings: Allan Alter, Special Report Electronic Commerce: Joe Maglitta and Bruce Rayner, Parallel Processing, Global 100, Job Satisfaction Survey, CEO Survey, Best Places to Work: Bruce Rayner, Client/Server Journal: Alan Alper

Dec. 4	Custom Publication: White Paper on Service Solutions for Client/Server (part 4 of 4-part Enterprise Software Directions Series)	Client/Server World Starch Chicago, 12/5 - 12/7 Study DB Expo New York City, 12/5 - 12/7
Dec. 11	Custom Publication: White Paper on Manufacturing Acquisition Strategies: A Guide for User Empowerment (part 4 of 4-part Manufacturing Series)	

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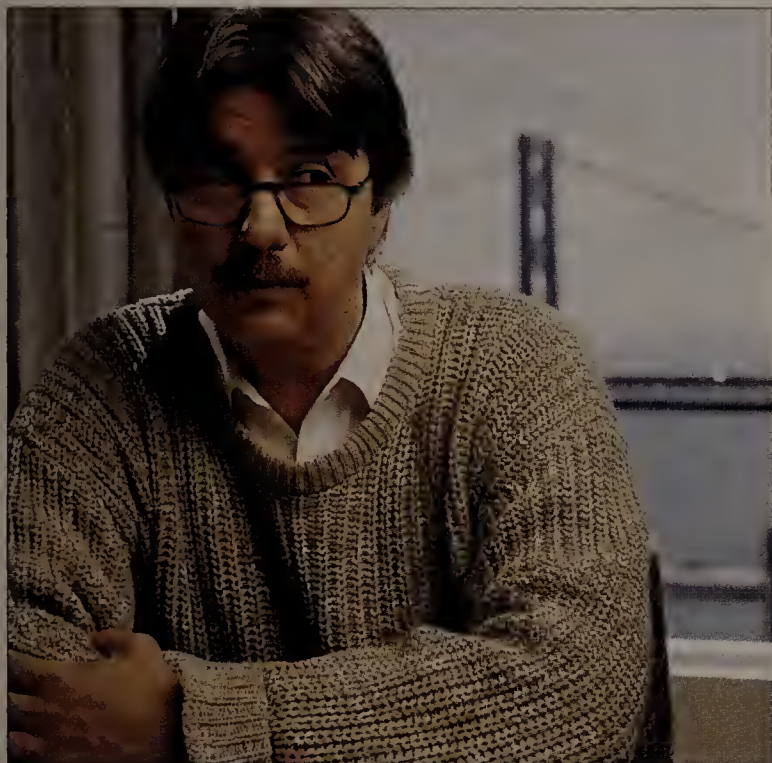
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LOVE IT

C / C + +

HATE IT



I love its portability

By David M. Baer

Anyone who would try to convince you that C/C++ is *not* good for developing business applications is a fool.

To begin with, as business application software is moved off the mainframe and onto desktop and open systems processors, you're going to have a difficult time avoiding C. Like it or not, in this milieu, C is the lingua franca.

This is an important point: As the common language, C has been forced down a path of rigid standardization. It's enormously consistent and portable across the entire spectrum of computing environments. Try to name even one computer processor of any significance that

doesn't have a C compiler available. You can't. End of story.

As the natural successor to C, C++ has inherited this legacy and is clearly a principal language of the future. Even without making use of its object-oriented capabilities, C++ is a powerful and positive improvement on C. It's more effective and less prone to error.

How is that? While some regard C's loose data-type matching requirements as freedom, others see them as anarchy; C++'s new coding rules, called type-safe rules, put more requirements on the coder and thereby greatly reduce the possibility of error.

Love it, page 118

Do you think C/C++ makes sense for developing business applications?
We found one IS pro who can't decide whether he thinks C/C++ is a great
marvel or the most unabashedly horrible technology he has ever encountered.
We just hope he doesn't come to blows with himself.



I hate its complexity

By David M. Baer

Anyone who would suggest C/C++ for business application development is an idiot.


Just because we're moving our applications off mainframes to open systems and PC platforms doesn't mean we have to embrace the default technology of these environments.

Use C or C++? Thank you, but I'd prefer my staff to be using modern, programmer-friendly development tools.

Even overlooking C's lack of native

data types for text character strings and decimal numerics (by far the two most prevalent kinds of business data), there's a fundamental problem with the language. So much of C's coding is pointer-based that it can't even really be called a high-level language. Having pointers in your face all day makes it difficult to produce error-free code, even if you're a superior programmer.

You might be able to produce the most
Hate it, page 118

 Baer, who has never been diagnosed with a split personality disorder, is director of technology at Tenera, Inc., an applications software and services firm in San Francisco. He admits to a love/hate relationship with C++. He can be reached via CompuServe at 76042,1427.

CONTINUED FROM PAGE 117

Of course, with objects (which I'll get to in more detail later), we also have standard data types, such as text character strings, filling a few gaps in C's repertoire. All this, and we've sacrificed neither the blazing execution of compiled C code nor C's unmatched ability to interface with the operating environment.

What does this technology mean to your firm? Well, for starters, you have a huge skill pool to draw upon to staff your development efforts because nearly all computer science graduates know C. You're not stuck footing the bill for training them in the latest language fad.

Next, by using C/C++, you have a development capability suitable for just about any kind of project. Are you tackling client/server? Modeling? Database applications? Distributed processing? Number-crunching analysis? You name it, C/C++ can be used to do it. Just try to do graphical user interface coding in Cobol or heavy-duty computations in Microsoft Corp.'s Visual Basic or Powersoft Corp.'s PowerBuilder. Good luck!

But that's not all. There is a wonderful set of support tools available to use in C and C++ development: language-aware editors, code formatters, debugging tools, standards-compliance aids and so forth.

And I haven't even started talking about real power—that is, about object-oriented development. It's no accident that C++ is widely used for object-oriented development and that it has the lion's share of third-party library support. C++ has it all: great features such as operator overloading and multiple inheritance and templates—the works.

There are those who complain that C++ is too complex. Well, I've got two points to make in response. First of all, it takes more than a simple tool to handle a com-



PHOTOGRAPH BY JOHN HARDING

LOVE IT

C/C++

CONTINUED FROM PAGE 117

efficient executables this way, but that kind of consideration is rarely valid for business software operating in the inexpensive, high-performance execution environments of today. The cost benefits curve for programming vs. execution efficiency was crossed a long time ago. These days, \$100,000 will usually buy you a lot more additional processor power than code efficiency.

Name any type of project, and I'll propose a better alternative than C or C++. For simple Windows development, I'd pick Microsoft Corp.'s Visual Basic, which programmers can learn in a fraction of the time it takes to master Windows programming using C/C++. Or try Borland International, Inc.'s new Windows development tool, Delphi. Developers can use it not only for simple Windows development but for complex development and client/server technology as well.

And in the area of client/server, add to the list Powersoft Corp.'s PowerBuilder and Gupta Corp.'s SQL Windows. I can take any one of these, and my team's going to finish so far in front of the one trying to use C or C++ that it won't even be a contest. These tools were built with rapid graphical user interface (GUI) development in mind, which is certainly not the case with C or C++.

And for virtually any kind of development, there's our old friend Cobol. Cobol is a vibrant, evolving language. New verbs and syntactic constructs permit programmers to write complex code with clarity and ease.

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And while we're at it, for all of C's proclaimed portability, the most portable programming environment you

HATE IT



plex project. For instance, you've probably got some Visual Basic development going on in which your programmers are using third-party components. Now those components can be quite complex to build, but you can't tell me you're not getting great mileage out of them. Your programmers don't need to understand how these tools are built to use them effectively.

Maybe it helps to think of C++ classes as components, offering the same productivity benefits. So, just buy a few good libraries, use them and get on with it.

Unlike the Visual Basic components, however, you have the option of extending and customizing the library classes to work exactly the way you want them to.

The other response to the complexity issue is that, upon first encountering object-oriented development disciplines, you will inevitably struggle to understand how to use this new programming model effectively. It's easy to blame the language, but face it—getting up to speed on object development is a challenge no matter what programming vehicle you use.

That challenge will be minimized with C++, given its wonderfully rich set of texts and training materials. Of course you could just ignore object-oriented technology, stick your head in the sand and hope you reach retirement before a pink slip reaches your desk.

Assuming you've gotten the message that object orientation is here to stay, then what's your best option? Some convoluted mishmash of legacy technology augmented by trendy, proprietary tools? No way. C++ is already well established and has the momentum to carry it much further. C++ developers are doing some of the most inspired software engineering today.

Your business simply can't ignore this important technology. In today's competitive environment, it's essential to use the best tools for the job. ■

can find these days is Micro Focus, Inc.'s Cobol. How wonderfully convenient, then, that Cobol is the language in which most of our business application specialists are already trained.

That quality is particularly relevant when you consider the issues of bringing object-oriented technology into the world of business software production. Object-oriented Cobol is becoming available, and it's got the full weight of an ANSI-standard specification behind it.

C++ may be an improvement on C, but there's still too much C at the heart of it. The plethora of pointers isn't even the real problem; the real problem is the level at which classes are defined and at which objects function. In C++, the ability to define objects so you can use them in arithmetic and I/O statements is the principal reason this technology is so forbidding.

Clever? Of course. Even fascinating. But is this sort of thing appropriate or even needed for business objects such as accounts, schedules or customers? Hardly. Business objects don't need all of C++'s capabilities.

The cost of those capabilities is an enormous complexity in the language. And there's a good chance that complexity will turn around and bite you when you get into C++ programming for real. Sure, there are plenty of C programmers running around who claim to know C++, but when it comes to the details of writing C++ classes, it gets to be rocket science fast. See how quickly your C++ "stars" disappear.

By contrast, the object model used in object Cobol is not only a good fit for business problems; it also allows a far cleaner, understandable language specification.

Given that it's probably much closer to where you are now in knowledge and skill than any other option, it's the tool that's your best bet for success. ■

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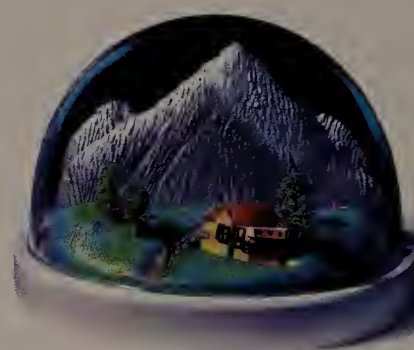
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SWAT TEAMS: Life on the edge

You'll deal with risks and changes, but you can learn and get ahead

By Linda Wilson

Pamela Mora graduated from college in 1992. Since then, she has become proficient in Notes, learned a bit about Oracle and been promoted from programmer to project manager.

What's her secret? Though career success usually can't be attributed to one factor, a bit of Mora's upward mobility is probably a result of being a member of a high-profile SWAT team at Texas Instruments, Inc. in Dallas.

SWAT teams, or expert teams as they're sometimes called, are a fairly recent phenomenon in the information systems world. They rose out of the need to effectively handle client/server projects.

The basic idea is to attack development projects with a crack team of the best and brightest experts in the latest technology. A team is assembled with each project. The teams are small — about five members — or are made up of a series of small subteams for a large project.

The idea to pool the talents of people with specialized skills developed because IS shops found that generalists, who can't possibly keep abreast of every technology, aren't suited to handle complex client/server projects. "To do client/server well, [it] takes extraordinary knowledge and skills — much more than the normal mainframe skills," says Doug Aldrich, the officer in charge of strategic information technology practice at A. T. Kearney, Inc., a consultancy in Chicago.

Following the theory that two heads are better than one, the team environment magnifies the creative power of individual experts, allowing them to craft better solutions as a group than they would individually.

SWAT teams have another advantage in the eyes of IS management: They enforce technology standards. "You need to have standards, and that is difficult to do in decentralized organizations. You can't just make proclamations and have them

stick," says Wayne Eckerson, editor in chief of "Open Information Systems," a newsletter published by the Patricia Seybold Group in Boston. He says it's much more effective to send out a crack team of experts that will develop projects according to corporate standards.

On the plus side

Participation on SWAT teams has several advantages. Being a member of a team allows you to learn the latest, hottest technology. By assimilating the knowledge of several people, you'll probably learn more about a given technology than you'd figure out working alone.

And if you manage your career right, you will master a new technology with each team. "Technology moves so fast that you have to be continually building your repertoire of skills, otherwise you are going to be last year's news," Eckerson says.

Mora agrees that SWAT teams are a learning experience. For the past five months, she has been a member of a five-person team devoted to rolling out 11 Notes applications. She says she expects the team, which is in the midst of deploying the applications, to disband in

December. She will then join another team as a project manager.

SWAT teams also foster cross-training. Because some of the applications Mora's team worked on required a structured database in addition to Notes, Mora learned a bit about relational database management systems when the team decided to use Oracle, a relational database product from Oracle Corp. in Redwood Shores, Calif.

Depending on the scope of the project, team members may learn more than just technology skills. If a technology project is part of a broad re-engineering effort, team members learn about business-process analysis, operations management and change management. This happens even more if a SWAT team comprises technology people and businesspeople. "It's an exposure to how the busi-

ness really works, which makes you a valuable commodity. It is like getting an MBA in your business," Aldrich says.

SWAT team members also hone their people skills. Anita Landis, a systems analyst at Lockheed Martin Corp., says she learned valuable skills as a team member. "You have to learn to speak up and that it's OK to say no. And you have to learn to compromise," says Landis, who works at the company's Valley Forge, Pa., office.

Because the teams tend to be high-profile, being a member of a successful one can help your career. Take for example Paul Pelotte, vice president of distributed computing and telecommunications at Lockheed Martin Missile and Space.

Pelotte joined his first team in the late 1980s when he worked at GE Aerospace, which merged with Martin Marietta in April 1993. Pelotte, an advocate of SWAT teams, now manages 30 teams at Lockheed Martin. "Certainly, people grow faster through interaction with other people," he says. "People become leaders [because] they have to learn to deal with people."

The downside

Joining a SWAT team isn't without risks, however. Indeed, the advantages of working on a SWAT team can also be the disadvantages. How you weigh the advantages and disadvantages will probably reflect your personality and outlook. If you're uncomfortable in unstructured environments, you might not be happy on a SWAT team. A SWAT team, like any team, is much more fluid than a hierarchical department because there aren't clearly defined rules or solid lines of authority. Teams reflect the individual personalities involved.

The somewhat chaotic nature of the team is worse at the beginning. For example, Landis was a member of a team that worked on a cost-management system for four years. She recently joined a new team to develop an accounts payable system. Because she and her former teammates worked together for so many years, they learned to trust and understand one another, and the team evolved into a highly productive unit. With the new team, Landis must start over.

Of course, a bigger downside is the risk

SWAT TEAMS: ARE THEY FOR YOU?

PLUSES

- Learn cutting-edge technologies
- Find opportunity for cross-training
- Refine people/group skills
- Learn about business
- Learn about re-engineering/business-process analysis
- Find opportunity for variety of assignments and, in some cases, variety of locations

MINUSES

- Must adjust to fluid situation with lack of rules and structure
- Must adjust to risk-taking environment, bold thinking
- If team doesn't work, project could fail



"People become leaders [because] they have to learn to deal with people."

— Paul Pelotte, Lockheed Martin

that team members simply won't be able to work together. "It's difficult to find the right mixture of people who happen to mesh and click," Landis says.

There are several other reasons why teams and projects fail. The project might be based on unworkable technology or processes that simply don't make sense for the business involved.

Whatever the reason, being associated with a failure hurts. "That failure will be pasted on your head as a scarlet 'A,'" Aldrich says. Because SWAT teams tend to work on risky, high-profile projects, the odds and costs of failure are somewhat higher than on run-of-the-mill assignments. Despite the risks, SWAT teams often craft successful projects.

Just as being part of a failure can bring that scarlet "A," being part of a success is rewarding and good for your career. ■

Wilson is a freelance writer in Glen Ellen, Ill.

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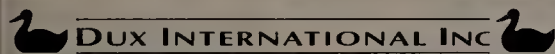
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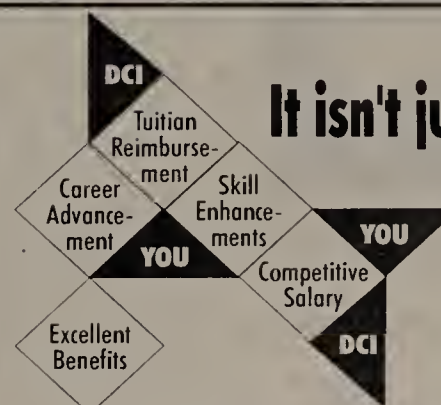
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PROGRAMMER ANALYST [2 openings] (Ref: 156195) to consult with clients to ascertain & define their business requirements or problem areas & utilize technical expertise to provide solutions to clients' needs; analyze, design, develop/implement computer software for clients' EDP systems; develop & implement an application that forms Graphical User Interface for an insurance company's on line sys. running user IBM 3090. Development, sys. testing & meeting with users to gather requirements using IBM-PC/AT 486, MS-DOS, MS-Windows Operating System/Environment & MS-Visual Basic, MS-Visual C++ Language, SQL Server & MS-Windows, OS/2, LAN Manager, MultiSoft's WCL (Windows Communication Library), Winrunner for Windows, Visual Architect for Visual Basic, SpyWorks for VB, Crystal Report Writer for VB, Rabbit Software Corporation's 3270 Emulator. Reqs. Bach. in Comp. Sci., Computer Information Systems, Computer, Electrical or Electronic Engineering, Systems Analysis, Mathematics or its equiv. in ed. & exp. 1 yr. exp. in job offered or 1 yr. related exp. as a Programmer, Systems Programmer, Programmer/Analyst, Systems Analyst, Software Engineer, Consultant or Teaching Assistant. Will accept 3 yrs. college ed. plus 3 yrs. exp. in job offered or related occup. in lieu of req'd ed. & exp. Must have some related exp. including design & development of client-server applications and using MS-Windows, Visual Basic & SQL Server. \$42,940/yr. 40 hrs/wk., 8:30a-5p. Send resume to 7310 Woodward Ave., Rm 415, Detroit, MI 48202 & include Ref #. Employer Paid Ad.

Programmer Analyst to plan, develop, test and document computer programs applying knowledge of programming techniques and computer systems; evaluate user requests for new or modified programs to determine feasibility, cost and time required, compatibility with current system and computer capabilities; consult with users to identify current operation procedures and clarify program objectives. Responsible for analysis, screen design, report design, coding both on-line and batch programs, coding JCL, deriving test scenarios, unit and integration testing and documentation of a customer information system. Duties also include use of IBM 3090, XDB, IMS DB/DC, DB2, COBOL II, XPEDITER, TSO/ISPF, JCL and ADW. Reqs: Bachelor's in Comp. Science, Sys. Analysis, Comp. Info. Systems, Comp. Engg., Electrical Engg., Electronic Engg., Mathematics or its equiv. in ed. & exp. Will accept 3 yrs. of college ed. plus 3 yrs. exp. in the job offered or in a related occup. in lieu of the required ed. & exp.; 2 yrs. exp. in job offered or 2 yrs. exp. in a related occup. as Programmer, Programmer Analyst, Systems Analyst, Software Eng., Consultant, Module Leader or Senior Systems Assoc. Must have 1 yr. related exp. which included using each of the following: IBM 3090, IMS DB/DC, DB2, COBOL II, XPEDITER, TSO/ISPF, JCL and ADW. \$53,000/yr. 40 hrs/wk., 8a-5p. Send resume to 7310 Woodward Ave., Rm. 415, Detroit, MI 48202. Ref. #159595 "Employer Paid Ad"

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Manufacturing (not computers)	126,464
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Banking/Financial Services	83,985
Government Federal/State/Local	144,312
Business Service (except DP)	27,035
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SOURCE: Skill Survey of Computerworld's Audience, August 1994.

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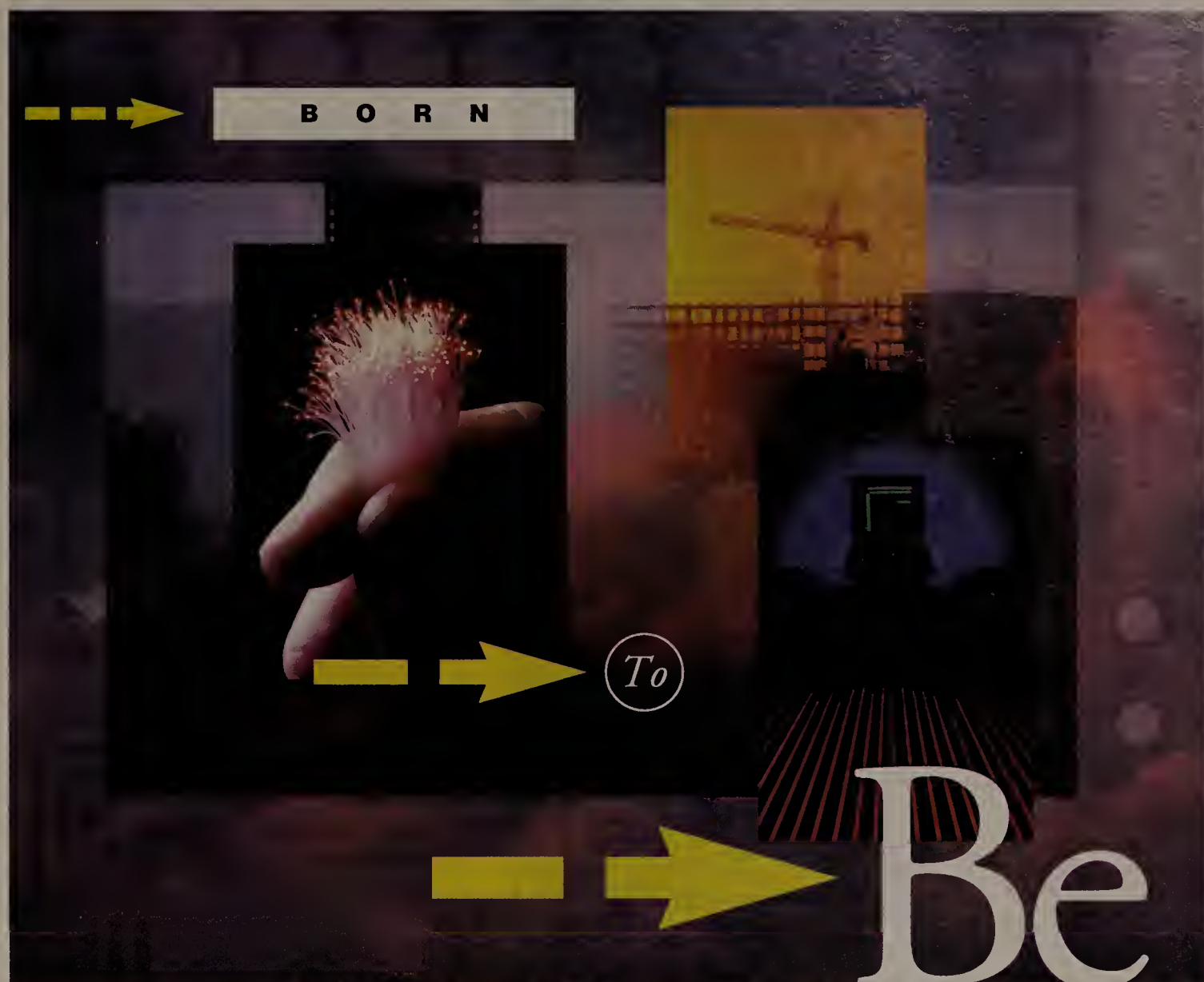
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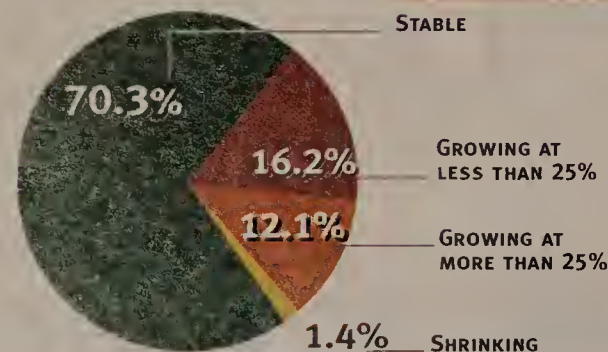
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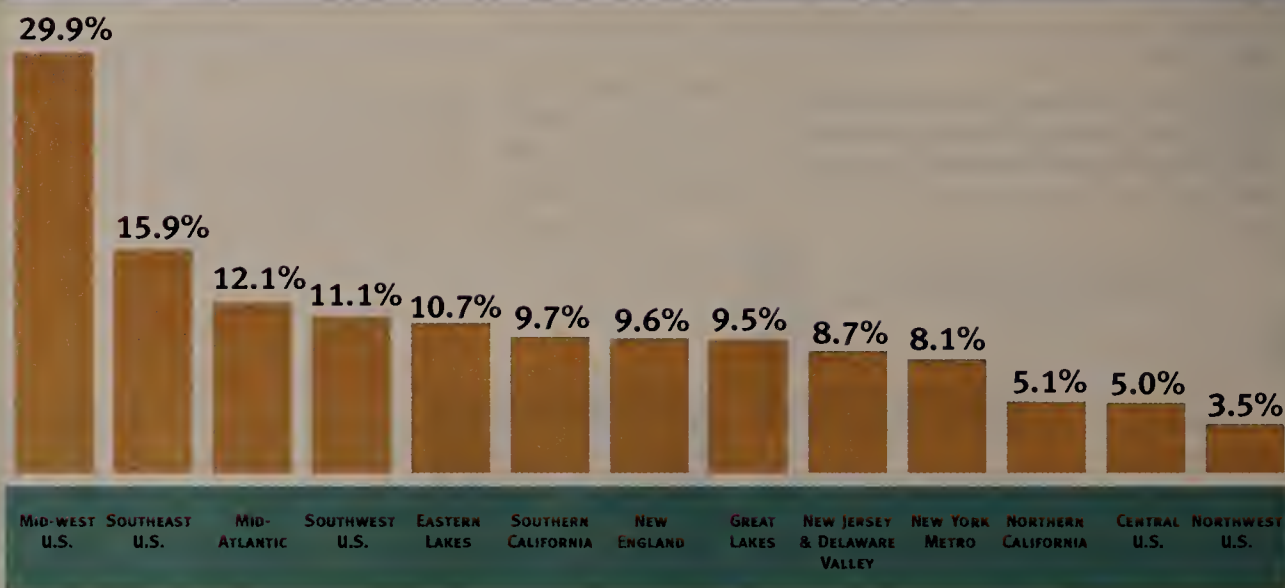


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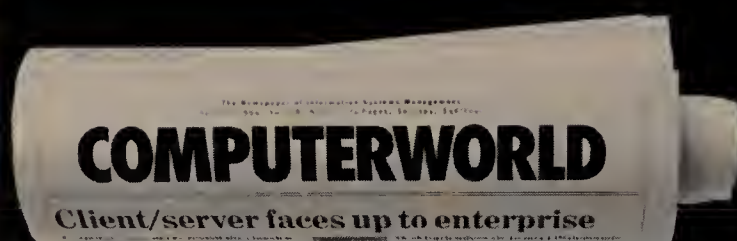
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9:00 a.m. - 9:30 a.m.	Registration & Continental Breakfast
9:30 a.m. - 10:00 a.m.	How To Pick The Right People
10:00 a.m. - 10:30 a.m.	Break
10:30 a.m. - 11:00 a.m.	The Top 10 Trends Affecting Information Systems Careers
11:00 a.m. - 11:30 a.m.	Luncheon/Keynote Address
11:30 a.m. - 12:00 p.m.	Break
12:00 p.m. - 12:30 p.m.	Town Hall Forum
12:30 p.m. - 1:00 p.m.	Break
1:00 p.m. - 1:30 p.m.	Networking & Lunch
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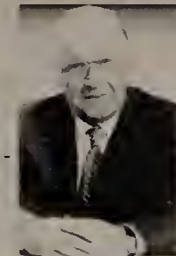


THE TOP 10 TRENDS AFFECTING INFORMATION SYSTEMS CAREERS 12:15 - 2:00 p.m.

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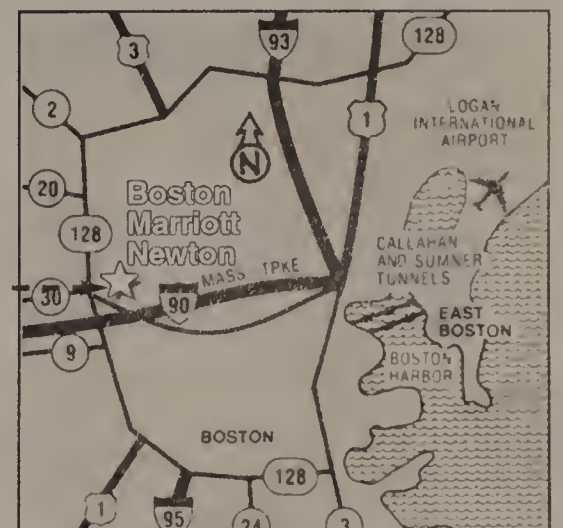
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Marketplace

Painful realities for peer-to-peer

Low-end network vendors must find new opportunities as operating systems take over their old roles

By Daniel Lyons

The market outlook for peer-to-peer networking is every bit as bright and promising as that of the manual typewriter and the rotary telephone — at least that's the prognosis from some pundits who say the client/server paradigm eventually will exterminate peer-to-peer networks.

Adding to the woes of peer-to-peer networking companies is the fact that big players such as IBM and Microsoft Corp. have begun building peer-to-peer functionality into their operating systems.

"The existing peer-to-peer companies are definitely being impacted by the client/server paradigm, and Windows 95 represents the beginning of the final throes of a process that is inevitable," says Brad Day, director of client/server computing research at Dataquest, Inc., a market research firm in San Jose, Calif.

For evidence of the trend, consider that sales at Artisoft, Inc., a leading peer-to-peer vendor, declined 22% from 1994 to 1995 and that the company posted a loss of \$5.8 million during that period. Or note that several vendors have gone out of business.

However, hope springs eternal, and some say reports of the demise of peer-to-peer networking are premature. One peer-to-peer proponent is Frank Berko, chief executive officer and founder of Moses Computers, Inc., one of the first compa-

nies to enter the peer-to-peer market and one of the survivors. "Windows 95 is creating the biggest opportunity for us that I've ever seen," he says.

Berko's theory is that the introduction of yet another operating system adds to the confusion in the market. He says Microsoft's Windows 95 creates more need for products that can connect machines running disparate operating systems. "We'll take the seams in the market, the seams between the different machines," Berko says. "That's big business. The peer-to-peer market is alive and growing, and it's going to get bigger."

Similarly, the people at Artisoft say they simply need to stay ahead of big players, such as Microsoft, by offering more features and better performance. They say the peer functionality in Windows 95 is limited in some ways. For ex-

ample, Windows 95 users can't access resources on DOS machines on a peer network. But LANtastic, Artisoft's peer-to-peer network operating system, will allow that kind of sharing.

"Until Windows 95 is used on the majority of PC nodes, we're going to have that advantage," says Ken Kark, product line manager at Artisoft in Tucson, Ariz. "And by the time Windows 95 becomes the majority of what's on the network, we will have become much more robust and will have created other ways to differentiate our product."

Lyons is a freelance writer in Ann Arbor, Mich.



Peer-to-peer networks

Leading peer-to-peer networking products

LANtastic 6.0

Price: \$119 per node; five-user pack costs \$499.

Snapshot: With more than 3½ million nodes worldwide, LANtastic 6.0 is by far the most popular peer-to-peer network operating system, analysts say. Artisoft has been going upscale, introducing a product called LANtastic Dedicated Server, which can improve the performance of a LANtastic network by as much as 100%. Another step in its upscale climb is LANtastic PowerSuite, a bundle that integrates LANtastic with mail, organizer, fax-sharing and modem-sharing applications.

ARTISOFT, INC.

Tucson, Ariz.
(800) 233-5564

PowerLAN 3.1

Price: \$99 for one user; five-user pack costs \$399.

Snapshot: PowerLAN 3.1's strong suit is its scalability, according to Performance Technology, Inc. The network operating system supports up to 200 users when PowerLAN 3.1 is beefed up with a dedicated server component that costs \$299. PowerLAN 3.1's server technology is based on software developed 10 years ago, originally to replace minicomputers with dedicated servers.

PERFORMANCE TECHNOLOGY, INC.

San Antonio
(800) FAST-LAN

MosesWin

Price: Two nodes for \$298.

Snapshot: MosesWin is the latest in a long line of peer-to-peer products from Moses Computers, Inc., one of the first companies in this market. MosesWin is Windows-oriented, compared with its predecessor, MosesAll, which was DOS-oriented. MosesWin comes with cabling and network interface cards, key differentiators.

MOSES COMPUTERS, INC.

Los Gatos, Calif.
(408) 358-1550

Personal NetWare 1.0

Price: \$99 for one user; five-user pack costs \$395.

Snapshot: Novell, Inc. introduced Personal NetWare in 1993, but in the past year, the company has been steering customers toward NetWare 4.1 as part of its emphasis on client/server computing. Novell considers peer-to-peer networking to be a limited paradigm. Even small customers that might once have chosen peer-to-peer networking will be better off with NetWare 4.1, officials say.

NOVELL, INC.

Provo, Utah
(800) 453-1267

InvisibleLAN 3.54

Price: \$149 for single-user software license.

Snapshot: Another peer-to-peer pioneer, Invisible Software, Inc. was founded in

1984 and has broadened its product line over the years. Today, the company's chief differentiator is that its software can be purchased in bundles with cards and cables. The company plans to add high-performance hardware such as 100M bit/sec. network interface cards to its product lineup soon.

INVISIBLE SOFTWARE, INC.

Foster City, Calif.
(800) 982-2962

Windows 95

Price: \$209 retail; \$109 for upgrade.

Snapshot: Peer-to-peer functionality isn't the raison d'être of Microsoft's new operating system. Nevertheless, Windows 95 has peer-to-peer functionality that surpasses that of Windows for Workgroups. Among the biggest advances is the system's more sophisticated security features.

MICROSOFT CORP.

Redmond, Wash.
(206) 882-8080

OS/2 Warp Connect

Price: \$165.

Snapshot: Offering peer-to-peer as a side feature, OS/2 Warp Connect's strength, officials say, lies in its interoperability with major peer-to-peer systems. There are also remote access features and TCP/IP for Internet access.

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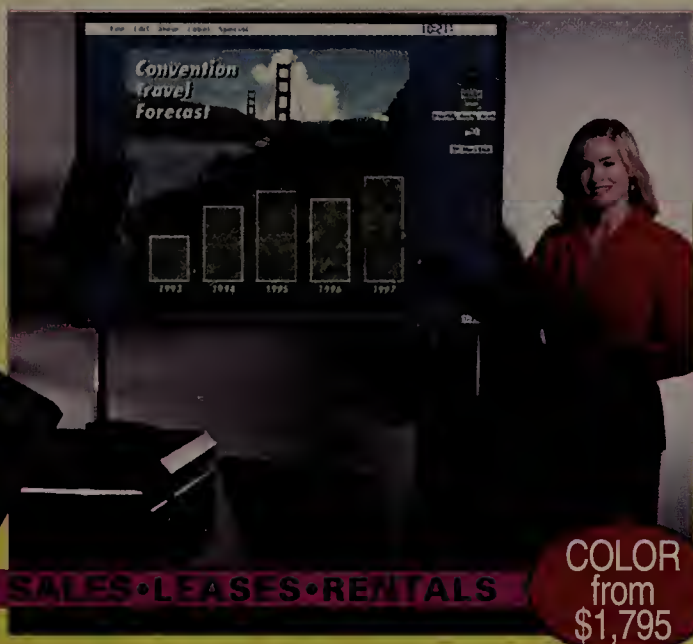
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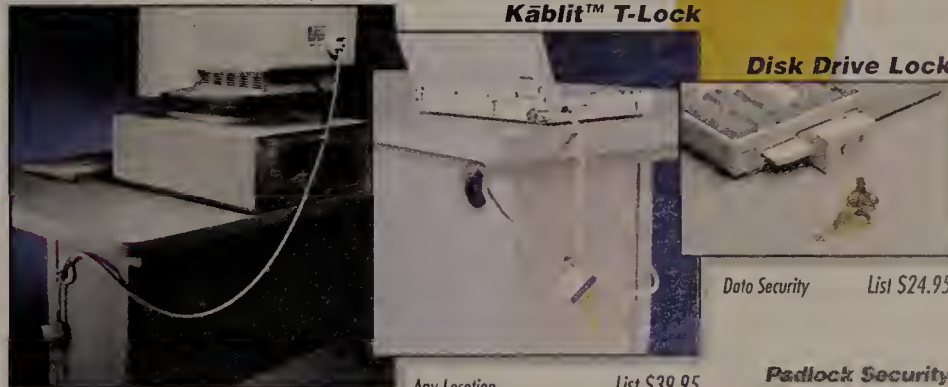
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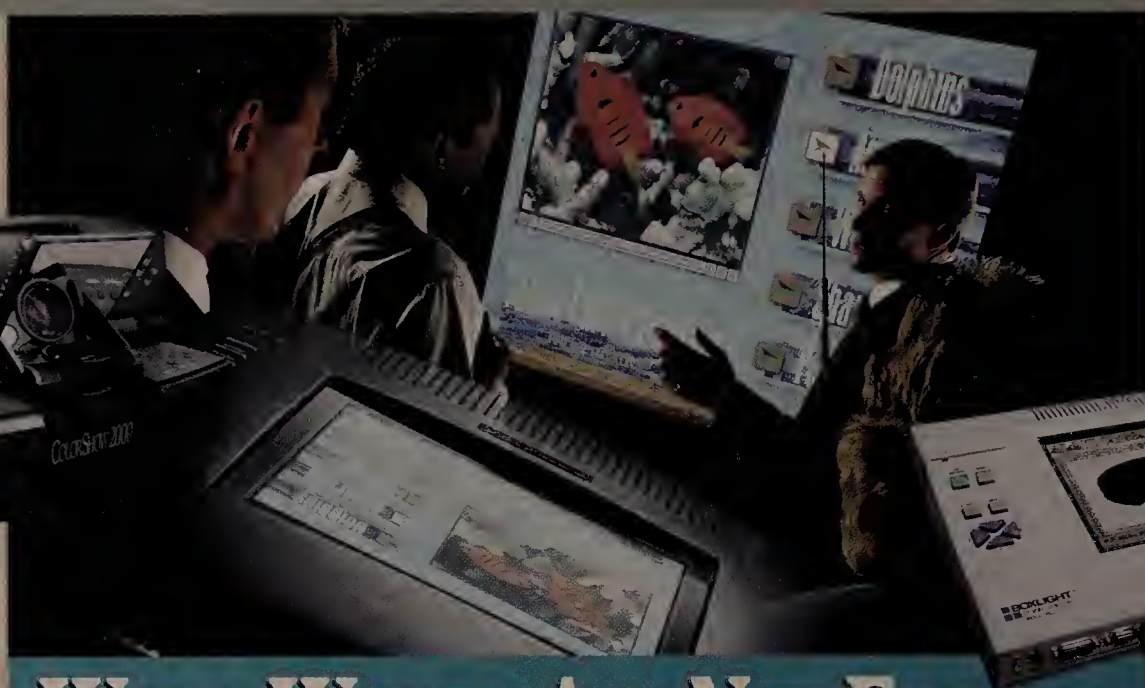
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All editors can be contacted at our main phone number, (508) 879-0700, unless otherwise noted below. Our 24-hour news tip line is (508) 820-8555. For subscriptions, call (800) 669-1002, back issues, call (508) 820-8129, reprints, call (508) 820-8125.

Our main fax number is (508) 875-8931.

CONTACTING US BY E-MAIL

All of our staff members can be reached via E-mail on the Internet using the form firstname_lastname@cw.com. IDG news service correspondents can be reached using the form firstname_lastname@idg.com.

Letters to the editor are welcome and should be sent to letters@cw.com. Please include your address and telephone number.

Our CompuServe address is 76537,2413 for editorial correspondence only. Direct subscription inquiries to CompuServe: 73373,1230.

Respond to our Talkback inquiries at talkback@cw.com.

CONTACTING CW EDITORS

We invite our readers to call or write with comments and ideas. It is best to submit ideas to one of the department editors as well as to the appropriate beat reporter.

Editor in Chief Bill Laberis (508) 620-7728
Editor Paul Gillin (508) 620-7724

DEPARTMENT EDITORS/NEWS

News Editor Maryfran Johnson (508) 820-8179
Sections Editor Johanna Ambrosio (508) 820-8553
Assistant News Editor Patricia Keefe (508) 820-8183
Assistant Sections Editor Michael Fitzgerald (508) 820-8206

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Government and security news Gary H. Anthes (202) 347-0134
Social and legal news Mitch Betts (202) 347-6718
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SENIOR WRITERS/NEWS

Mobile computing Mindy Blodgett (508) 820-8168
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STAFF WRITERS/NEWS

New Products Writer Stewart Deck (508) 820-8155

OPINIONS/VIEWPOINT

Technical Editor Charles Babcock (415) 548-5512
Viewpoint Editor Mitch Betts (202) 347-6718

DEPARTMENT EDITORS/FEATURES

Technology Evaluations/CW Guide James Connolly (508) 820-8144

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Management Allan E. Alter (508) 620-7714
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ASSOCIATE EDITORS/FEATURES

Management David B. Weldon (508) 820-8166
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RESEARCH

Bob Fink, senior research manager (508) 820-8116; Kevin Burden, senior researcher; Laura Hunt, research analyst; Amy Malloy, assistant researcher; Stefanie McCann, graphics coordinator.

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COMPUTERWORLD CLIENT/SERVER JOURNAL

Alan Alper, editor (508) 820-8115; Catherine McCrory, managing editor; Mary Brandel, senior editor; Stephanie Faucher, art director; Kimberlee A. Smith, copy editor.

IDG NEWS SERVICE CORRESPONDENTS

Paris bureau chief Marc Ferranti (33) 1-4904-8001
Paris correspondent Cara Cunningham (33) 1-4904-7917
Munich correspondent Torsten Busse (49) 89-811-6057
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INTUIT INC. (H)	17.6	SOFTWARE SPECTRUM INC.	-17.2
STRATACOM INC. (H)	17.4	DATWARE TECHNOLOGIES INC.	-17.2
SYSTEMSOFT CORP.	17.2	CE SOFTWARE	-16.7

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CABLETRON SYSTEMS (H)	7.88	ZILOG INC.	-3.50
PICTURETEL CORP.	7.50	SIERRA SEMICONDUCTOR	-3.00
DELL COMPUTER CORP.	7.25	PROGRESS SOFTWARE CORP.	-2.88

A second look at young IPOs

Last week, we looked at the first seeds planted with recent technology initial public offerings (IPO). This week, we thought we would revisit some IPO saplings from the third and fourth quarters of 1994 and see how they have grown since they first hit the market.

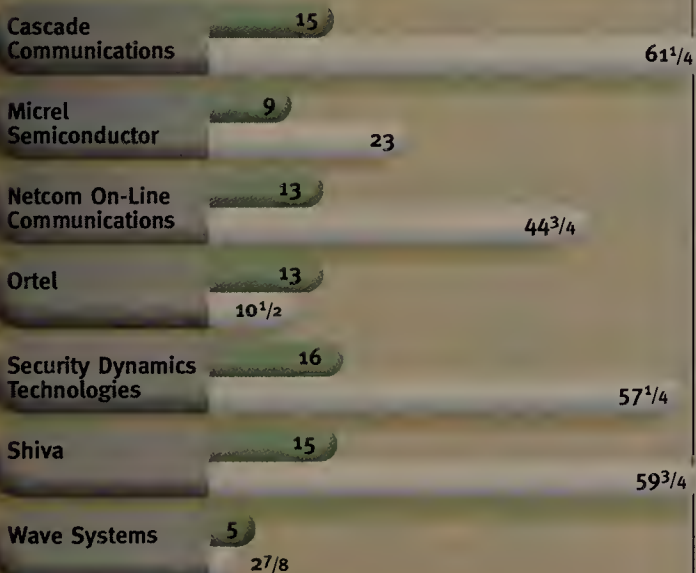
From July through December last year, the IPO market in technology was slow. There were only 20 new offerings with more than \$50 million in capitalization, compared with 73 in the past six months. Although few in number, these IPOs have far outpaced the rise of the market; as a group they have risen an average of 108%, compared with an increase of 36% since last October for the technology-heavy NASDAQ composite index. Of the 20 offerings, only three have a stock price below their initial offering price.

One of the leaders in this growth spurt has been **Micrel Semiconductor, Inc. (MCRL)** (see chart). Micrel's voltage regulator and converter products, which are used in PC motherboards and cellular phones, entered the market when demand had skyrocketed, said Drew Peck, a market analyst at Cowen & Co. in Boston. But Micrel's outlook for the next six months is a bit cloudy, Peck said, due to "the current chaos in the Taiwanese motherboard market and slowing demand in the cellular phone market."

Shiva Corp. (SHVA) and **Cascade Communications Corp. (CSCC)**, makers of networking products, posted the largest percentage gains. — *Stewart Deck*

What a difference a year makes

A sampling of IPOs from the third and fourth quarters of 1994

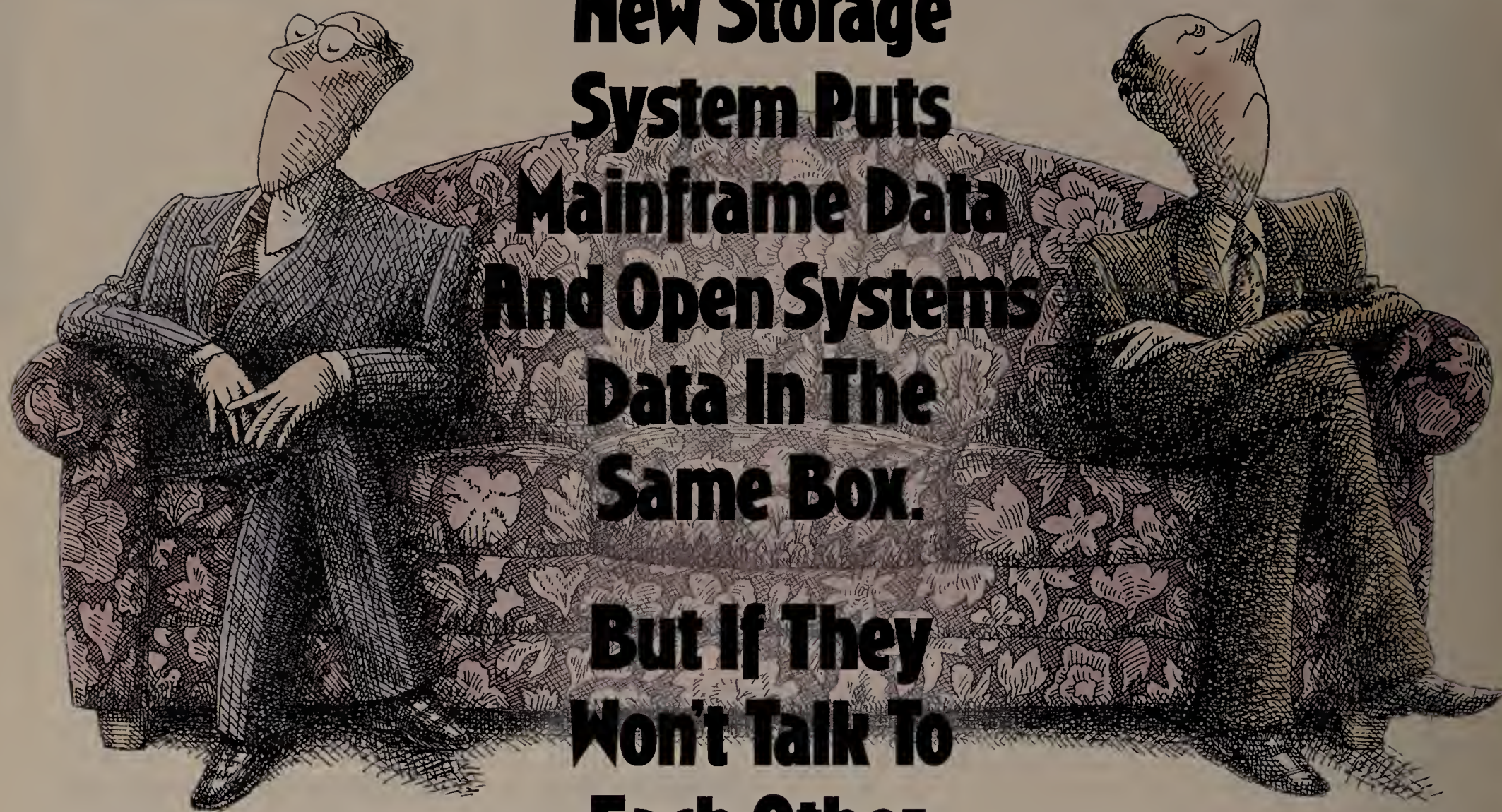


Stock price of IPO

Stock price at closing Oct. 18

Oct. 20 Stock Ticker

EXCH	52-WEEK RANGE			OCT. 20 Wk Net Wk Pct			EXCH	52-WEEK RANGE			OCT. 20 Wk Net Wk Pct			
				3 PM	CHANGE	CHANGE					3 PM	CHANGE	CHANGE	
Communications and Network Services							UP 1.59%							
COMS	53.63	19.25	3 COM CORP. (H)	51.75	5.75	12.5	MAPS	40.00	17.25	MAPINFO CORP.	20.19	-0.31	-1.5	
AIT	53.75	38.50	AMERITECH CORP.	53.75	2.13	4.1	MATH	7.38	2.00	MATHSOFT	5.63	-0.38	-6.3	
T	66.38	47.25	AT&T	62.00	-1.38	-2.2	MCAF	56.50	13.50	MCA FEE ASSOCIATES	53.50	4.25	8.6	
ASND	58.75	6.88	ASCEND COMMUNICATIONS (H)	55.88	6.38	12.9	MENT	21.38	10.88	MENTOR GRAPHICS	21.00	1.50	7.7	
8NYN	19.75	7.88	8ANYAN SYSTEMS INC. (L)	8.13	-0.75	-8.5	MIFGY	15.00	10.38	MICRO FOCUS (L)	10.38	-0.13	-1.2	
8NET	66.13	23.13	8AY NETWORKS INC. (H)	64.44	4.31	7.2	MGXI	13.88	5.00	MICROGRAFX INC.	11.50	1.25	12.2	
BEL	64.13	48.38	BELL ATLANTIC CORP. (H)	64.13	2.13	3.4	MSFT	109.25	55.06	MICROSOFT CORP.	96.13	8.38	9.5	
BLS	76.75	50.50	BELLSOUTH CORP.	75.25	1.50	2.0	NETM	27.25	12.00	NETMANAGE INC.	20.25	0.00	0.0	
88N	39.38	12.63	BOLT, BERANEK & NEWMAN	34.75	-0.38	-1.1	NSCP	74.75	45.75	NETSCAPE COMM. CORP.	70.00	2.69	4.0	
8RKT	22.25	9.25	BROOKTROUT TECHNOLOGY	19.00	0.00	0.0	ORCL	47.00	24.75	ORACLE CORP.	42.94	2.94	7.3	
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MICM	15.50	5.50	MICOM COMMUNICATIONS CORP.	9.38	-0.25	-2.6	SSW	48.88	29.38	STERLING SOFTWARE INC.	48.88	3.63	8.0	
MNPI	22.25	7.13	MICROCOM INC.	18.25	0.25	1.4	SDRC	21.13	4.63	STRUCT. DYNAMICS RESEARCH (H)	19.25	0.50	2.7	
NTRX	10.50	3.75	NETRIX CORP.	4.06	-0.44	-9.7	SY8S	55.00	19.88	SYBASE INC.	36.81	2.63	7.7	
NCDI	12.00	3.25	NETWORK COMPUTING DEVICES	5.63	0.06	1.1	SYM	33.25	15.00	SYMANTEC CORP.	27.50	1.38	5.3	
NWK	42.00	16.38	NETWORK EQUIPMENT TECH.	34.63	-2.00	-5.5	SNPS	34.50	19.75	SYNOPSYS	32.25	4.50	16.2	
NETG	46.50	18.63	NETWORK GENERAL (H)	40.31	1.19	3.0	SSAX	45.75	11.63	SYSTEM SOFTWARE ASSOC.	37.81	-0.56	-1.5	
NN	43.38	25.00	NEWBRIDGE NETWORKS CORP.	29.13	2.25	8.4	SYSF	18.13	6.25	SYSTEMSOFT CORP.	14.50	2.13	17.2	
NT	41.00	31.25	NORTHERN TELECOM LTD.	32.75	-1.38	-4.0	VIEW	24.00	7.88	VIEWLOGIC SYSTEMS	13.25	0.50	3.9	
NOVL	23.25	14.13	NOVELL INC.	14.25	-0.88	-5.8	VMRK	21.50	7.00	VIMARK SOFTWARE INC.	7.63	0.38	5.2	
NYN	48.75	35.88	NYNEX CORP.	48.25	0.38	0.8	WALK	9.75	4.63	WALKER INTERACTIVE SYSTEMS	7.50	-0.50	-6.3	
OCTL	42.63	17.75	OCTEL COMMUNICATIONS CORP.	30.38	-1.13	-3.6	WALL	55.50	14.50	WALL DATA INC.	16.00	-0.25	-1.5	
ODSI	43.25	9.00	OPTICAL DATA SYSTEMS INC.	29.50	-5.63	-16.0	WANG	19.50	9.13	WANG LABORATORIES INC.	16.38	-0.25	-1.5	
PNRL	8.38	2.13	PENRIL DATA COMM NETWORKS	6.75	0.00	0.0	Semiconductors						OFF 0.57%	
PCTL	62.00	16.50	PICTURETEL CCRP.	61.25	7.50	14.0	AMD	39.25	22.38	ADVANCED MICRO DEVICES	26.50	-1.00	-3.6	
PTON	10.75	4.75	PROTEON INC.	8.88	0.25	2.9	ADI	39.50	20.00	ANALOG DEVICES INC.	35.50	0.63	1.8	
RACO	7.88	3.00	RACOTEK INC.	6.25	0.13	2.0	ATML	36.75	15.38	ATEL CORP.	32.00	0.38	1.2	
RETX	5.75	3.50	RETIX	3.88	-0.25	-6.1	CHPS	15.88	5.13	CHIPS AND TECHNOLOGIES	11.94	-0.56	-4.5	
SFA	24.88	11.75	SCIENTIFIC ATLANTA INC.	12.00	-2.00	-14.3	CRUS	61.13	10.50	CIRRUS LOGIC	44.63	-2.88	-6.1	
S8C	55.88	39.50	SOUTHWESTERN BELL CORP.	55.63	0.88	1.6	CY	55.50	17.00	CYPRESS SEMICONDUCTOR CORP.	35.25	3.50	11.0	
FON	38.50	25.88	SPRINT CORP.	38.13	2.25	6.3	OS	24.88	13.38	DALLAS SEMICONDUCTOR	21.50	-0.13	-0.6	
SMSC	31.63	12.50	STANDARD MICROSYSTEMS CORP.	19.13	3.13	19.5	ISSS	34.25	11.63	INTEGRATED SILICON SYSTEMS	30.75	0.88	2.9	
STRM	59.00	24.75	STRATACOM INC. (H)	59.00	8.75	17.4	INTC	78.38	28.75	INTEL CORP.	67.63	3.56	5.6	
T8IT	8.13	3.38	TELEBIT CORP. (L)	3.38	-0.25	-6.9	LSI	62.50	18.25	LSI LOGIC CORP.	50.88	-0.38	-0.7	
USRX	93.50	16.00	US ROBOTICS	93.50	8.00	9.4	LSCC	43.00	15.50	LATTICE SEMICONDUCTOR	38.63	0.69	1.8	
USW	48.38	29.63	U.S. WEST INC.	47.00	0.13	0.3	MU	94.75	16.38	MICRON TECHNOLOGY	72.13	4.00	5.9	
XIRC	23.50	9.13	XIRCOM	9.88	-2.19	-18.1	MOT	82.50	51.50	MOTOROLA INC.	65.00	1.75	2.8	
XLGX	67.00	13.13	XYLOGICS INC.	67.00	4.75	7.6	NSM	33.63	14.63	NATIONAL SEMICONDUCTOR	25.75	-0.25	-1.0	
PCs and Workstations							UP 3.42%							
AALR	9.63	3.63	ADVANCED LOGIC RESEARCH	8.00	0.63	8.5	SERA	28.75	6.63	SIERRA SEMICONDUCTOR	20.75	-3.00	-12.6	
AAPL	50.13	33.63	APPLE COMPUTER INC.	35.13	-1.50	-4.1	TXN	83.75	12.75	TEXAS INSTRUMENTS	71.63	-1.25	-1.7	
ASTA	19.13	7.50	AST RESEARCH INC.	9.25	0.19	2.1	VLSI	39.13	10.63	VLSI TECHNOLOGY	26.63	-0.50	-1.8	
CPQ	54.88	31.13	COMPAQ COMPUTER CORP. (H)	54.00	4.50	9.1	WWTK	6.88	1.78	WEITEK	4.75	-0.75	-13.6	
DELL	93.88	36.75	DELL COMPUTER CORP.	89.75	7.25	8.8	WDC	22.13	13.13	WESTERN DIGITAL CORP.	16.75	1.13	7.2	
GATE	33.63	16.00	GATEWAY 2000 INC. (H)	30.00	-1.00	-3.2	XLNX	55.50	16.50	XILINX	45.13	1.50	3.4	
HWP	95.00	45.25	HEWLETT PACKARD CO. (H)	91.00	6.88	8.2	ZLG	54.13	34.50	ZILOG INC.	34.50	-3.50	-9.2	
MUEI	29.88	3.88	MICRON INTERNATIONAL INC.	22.31	0.56	2.6	Peripherals and Subsystems							UP 1.33%
SGI	45.63	24.88	SILICON GRAPHICS	32.50	-1.63	-4.8	APCC	25.88	10.38	AMERICAN POWER CONVERSION	12.88	0.88	7.3	
SUNW	74.63	29.88	SUN MICROSYSTEMS INC. (H)	71.50	12.13	20.4	ADPT	47.25	18.13	ADAPTEC INC.	43.63	2.25	5.4	
TAN	64.38	41.13	TANDY CORP.	54.88	-6.00	-9.9	8TEC	22.75	14.75	8ANCTEC INC.	20.19	-1.31	-6.1	
Large Systems							UP 3.65%							
AMH	13.63	8.63	AMDAHL CORP.	9.81	-0.19	-1.9	C8EX	13.13	3.38	CAMBEX CORP.	9.50	0.88	10.1	
CNX	8.88	3.63	CONVEX COMPUTER	4.50	0.00	0.0	CGN	6.38	1.38	COGNITRONICS CORP.	5.38	0.56	11.7	
CYR	29.25	14.63	CRAY RESEARCH INC.	21.13	-0.63	-2.9	CNR	19.50	9.00	CONNER PERIPHERALS (H)	18.63	1.13	6.4	
DGN	12.00	6.75	DATA GENERAL CORP.	11.25	1.25	12.5	CREAF	18.31	5.88	CREATIVE TECHNOLOGIES INC.	12.13	-0.44	-3.5	
DEC	53.63	28.88	DIGITAL EQUIPMENT CORP. (H)	53.63	4.50	9.2	RACE	13.13	3.50	DATA RACE INC.	4.44	-1.31	-22.8	
ENCC	4.13	1.06	ENCORE COMPUTER CORP.	1.88	0.31	20.0	DTM	9.38	4.50	DATARAM CORP.	8.13	0.63	8.3	
NHWK	18.50	10.25	HARRIS COMPUTER SYSTEMS CORP.	16.13	1.00	6.6	EMC	27.38	13.00	EMC CORP.	13.75	-0.75	-5.2	
IBM	114.63	68.88	IBM	97.38	4.13	4.4	EMXL	28.50	10.00	EMULEX CORP.	15.50	-0.13	-0.8	
MDCD	10.75	3.00	MERIDIAN DATA INC.	9.75	0.75	8.3	ESCC	21.75	11.25	EVANS & SUTHERLAND	21.75	4.75	27.9	
NETF	10.75	4.25	NETFRAME	6.25	0.13	2.0	EX8T	24.00	10.00	EXABYTE	13.00	0.50	4.0	
SQNT	25.38	14.13	SEQUENT COMPUTER SYS.	17.75	0.88	5.2	ISLF	4.25	1.88	INTELLIGENT INFO. SYSTEMS	2.69	0.06	2.4	
SEQS	10.00	3.13	SEQUOIA SYSTEMS INC.	6.00	0.00	0.0	IOMG	30.00	2.88	IOMEGA CORP.	22.25	1.38	6.6	
SRA	39.88	23.00	STRATUS COMPUTER INC.	24.63	0.25	1.0	IPLS	7.88	2.00	IPL SYSTEMS INC.	4.38	-0.06	-1.4	
TDM	19.75	10.75	TANDEM COMPUTERS INC.	11.25	0.00	0.0	KMAG	74.88	22.25	KOMAG INC.	69.50	7.13	11.4	
TRCD	7.63	3.38	TRICORD SYSTEMS	3.88	-0.25	-6.1	MXTR	7.25	2.63	MAXTOR CORP.	4.19	0.19	4.7	
UIS	13.63	7.38	UNISYS CORP.	7.38	0.00	0.0	MLIS	11.50	4.00	MICROPOLIS CORP.	4.00	-1.00	-20.0	
Software							UP 2.06%							
AD8E	66.50	27.25	ADOBE SYSTEMS INC.	53.25	3.50	7.0	PNCL	23.75	8.75	PINNACLE MICRO INC.	19.50	1.13	6.1	
AMSWA	8.63	2.50	AMERICAN SOFTWARE INC.	7.13	0.00	0.0	PTNX	38.75	13.25	PRINTRONIX INC.	18.00	-4.50	-20.0	
APLX	33.00	9.75	APPLIX INC.	29.25	-4.25	17.0	AQM	10.50	4.00	QMS INC.	4.50	0.00	0.0	
ACAD	53.00	30.75	AUTODESK INC.	36.25	-1.63	-4.3	QNTM	28.50	13.75	QUANTUM CORP.	20.75	0.63	3.1	
8ACH	7.88	2.00	8ACHMAN INFO. SYSTEMS	6.00	-0.25	-4.0	RDUS	15.00	3.88	RADIUS INC.	4.25	-0.50	-10.0	
8GSS	37.25	22.00	8GS SYSTEMS INC. (H)	35.50	0.13	0.4	REC	12.63	6.50	RECOGNITION INTERNATIONAL	12.13	0.00	0.0	
8MCS	51.50	20.50	8MC SOFTWARE INC.	34.88	1.38	4.1	SEG	49.38	22.88	SEAGATE TECHNOLOGY	47.25	4.50	10.5	
8OOL	33.63	19.88	8OOLE & 8ABBAGE (H)	33.63	4.63	15.9	STK	33.25	17.88	STORAGE TECHNOLOGY	24.38	0.50	2.1	
8ORL	17.25	6.00	8ORLAND INT'L INC.	13.63	-0.13	-0.9	TEK	61.88	31.38	TEKTRONIX INC. (H)	58.63	0.00	0.0	
8ROC	11.75	5.75	8ROCK CONTROL SYSTEMS INC.	6.88	-0.38	-5.2	XRX	135.38	90.63	XEROX CORP.	135.00	1.13	0.8	
CESH	3.75	1.53</												



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Tuxedo

CONTINUED FROM COVER 1

Boston. "It's a sophisticated bunch of complex functions, and that's clearly hard to sell," he said.

Sources said the enhancements in System 6, which ships immediately, include these key additions:

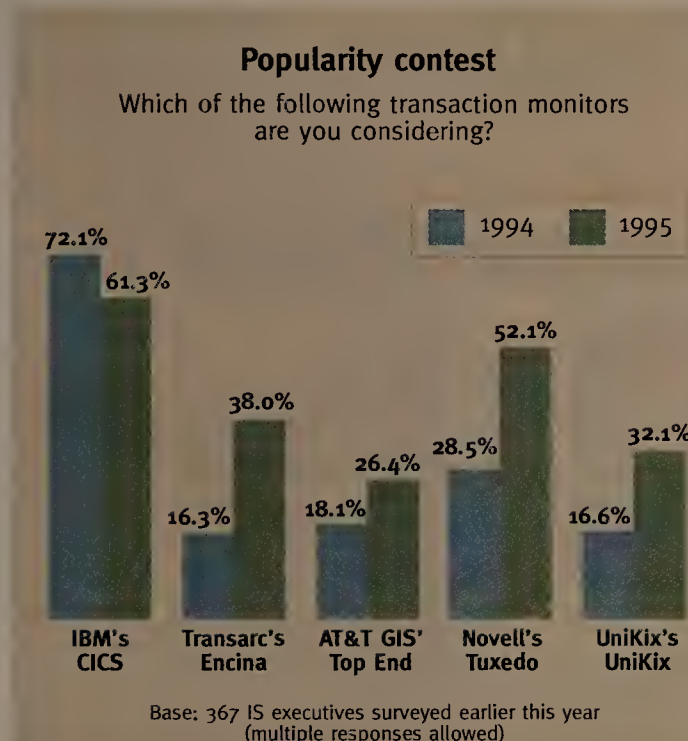
- A graphical user interface (GUI) based on the Open Software Foundation's Motif, for centrally managing distributed Tuxedo applications.
- More granular workgroup-level control of user access to Tuxedo services.
- An event broker supporting the so-called "publish and subscribe" technology (see glossary at right).

One downfall

A major shortcoming in Tuxedo has been its limited management capabilities, which could be invoked only through Unix command lines. The new centralized GUI will be "a big help," said Michael Prince, director of information services at Burlington Coat Factory Warehouse Corp. in Burlington, N.J. The company uses Tuxedo to funnel retail sales transactions into its back-office systems.

"One of the things that has held us back from using Tuxedo more widely than we have was the fact that the administration was primitive," Prince said. "You had to know the Unix commands, and it really wasn't friendly at all."

The event broker, which will let customers trigger multiple processing tasks



Source: The Standish Group International, Inc., Dennis, Mass.

based on predefined business events, also could be "an interesting building block" for future applications, Prince said. Burlington Coat Factory wants to use System 6 to expand Tuxedo into areas such as real-time check authorization and decision support, he said.

Tuxedo was the most popular Unix transaction monitor in 1994, with a 32% market share, according to The Standish Group International, Inc. in Dennis, Mass. However, it yielded just \$35 million in sales, and a Standish Group survey this year showed that customers expect to use transaction monitors in only about

one-third of their new business applications.

Tuxedo's new administration features, including the GUI and a companion management information base for storing network data, should "answer some of the criticisms leveled against Tuxedo that it's hard to work with," said Sally Cusack, a Standish Group analyst.

Meanwhile, the event broker propels Tuxedo into an emerging application area populated by middleware vendors such as Teknekron Software Systems,

Inc. and Stratus Computer, Inc.'s Isis unit. Novell appears to have the most flexible publish-and-subscribe approach to date, and Tuxedo's transactional nature lets it back out of multiple-step processes if something goes wrong, Kramer said.

Novell declined to comment on the Tuxedo System 6 launch other than to confirm it is scheduled for next week.

& Michael Schrage says Microsoft is running into the same software development problems identified 20 years ago. See page 37.

What it all means

Transaction processing monitor: Traffic cop software that manages the mechanics of providing end users with reliable access to distributed data. A monitor synchronizes system, network and application resources and handles tasks such as user authorization, security and restart/recovery of failed servers.

Management information base (MIB): A database of information about networked devices. A MIB can include data such as device status, peak performance thresholds, error rates, event detection and problem alerts.

Publish and subscribe: An emerging form of distributed data processing driven by business events. Middleware is used to trigger a series of processing steps across multiple applications in response to prespecified events such as electronic orders or stock price increases. Users are automatically notified when an event that affects them occurs.

Windows 95

CONTINUED FROM COVER 1

dows 95 product manager. Workarounds exist for most glitches, they said.

It's what users don't know that can and will hurt them. Take the case of the anonymous user who freely acknowledged his own ignorance in how to maintain or change network connections in Windows 95. He said, "I'm very open-minded. Maybe I just don't know how to use the Win 95 functions."

Quick help

In many cases, the fixes that would help users through the maze of migration woes are right at their fingertips in the Windows 95 Resource Kit. Or help is just a call away in the form of a free Application Notes that lists the cause/effect and fix for common stumbling blocks.

The most frequently encountered "gotchas" for NetWare users include the following:

- Failure of Windows 95 clients to connect to NetWare 4.x file servers in large networks with more than 255 simultaneous users. In this instance, users are literally locked off the network with no access to basics such as file or print services or electronic mail.

This issue cropped up just last week, and no workaround exists. Bennett and

Microsoft's technicians are researching the problem and said they expect to have a resolution soon.

- Hidden "attaches" to multiple, remote NetWare file servers when the Network Neighborhood facility within Windows 95 is opened. Network Neighborhood lets users browse the network to view shared resources and applications. When users single-click on a server from within Network Neighborhood, they unwittingly log on to other servers.

In this case, ignorance is not bliss: It can net the unsuspecting user and corporation a very large phone bill for a network that has an Integrated Services

Digital Network wide-area network with dial-on demand connections to remote offices. One user who had this unhappy experience logged on to the Window 95 CompuServe forum and plaintively asked for "any hints that would let him shut down the hidden automatic server attaches."

Fortunately, there is an easy remedy: Network administrators can simply disable the "Entire Network" option from within Network Neighborhood.

- NetWare log-in scripts that don't load terminate-and-stay-resident programs in Windows 95, making many everyday applications unavailable to users.

Solutions for common problems

The following are workarounds for some of the more common user complaints.

- **The NetWare log-in script won't run.** Four quick steps will fix that.

1. Make sure to set a preferred server in the properties for the Microsoft Client for NetWare Networks. 2. If the frame type for the IPX/SPX-compatible network protocol is set to "auto," change it to the frame type the NetWare server uses. 3. If there is a "lastdrive=" statement in the config.sys file, remove

it or disable it by inserting a semicolon at the beginning of the line. 4. Make sure the IPX/SPX-compatible network protocol appears on the bindings tab in the properties for the PC's network adapter.

- **The Windows 95 client is unable to see a NetWare server on a Token Ring network.**

To fix this, enable source routing. You can do this by clicking the start button, pointing to settings and clicking on the control panel. Next, double-

- NetWare log-in scripts not running, which locks users off the network.

- The inability of Windows 95 clients to see NetWare servers on Token Ring networks. This is a big network management headache because administrators would have to manage their networks blindly. Without being able to see the server, administrators couldn't monitor network usage or spot problems. A simple four-step software reconfiguration solves the problem (see story below).

Users can get a detailed Application Notes from the Microsoft FastTips Technical Library by calling (800) 936-4200, 24 hours a day, seven days a week.

click on the network icon. Then go to the configuration tab, click the IPX/SPX-compatible network protocol and click on properties. Finally, on the advanced tab, click on source routing in the property box and click on "16 entry cache (recommended)" in the value box.

- **To sidestep the hidden attaches to remote NetWare file servers** disable the "Entire Network" option in Network Neighborhood.

• **To avoid creating SAT security breaches** network administrators should turn off the network control panel so end users can't create a hole in the firewall. — *Laura Ordo*

Sequent taps 4-way Pentiums for parallel design

.....
Charles Babcock

Sequent Computer Systems expects to supply large servers using four-way Intel Pentium processor configurations as a building block. Intel is producing quad Pentiums (formerly known as P6s), or four microprocessors on a synchronized mother/daughterboard unit, to encourage server design with its chips.

What's interesting is that Sequent is using these symmetrical multiprocessing (SMP) units to get to a parallel processing design. Parallel processing is our most scalable computer architecture today, but it tends to require lots of system resources for each processor rather than assembling resources in a common pool.

Sequent is taking a low-cost CPU building block and arranging it in a design that can treat the cache memories of each block as shared across the system. It can't equal a massively parallel system with a thousand processors, but it promises to scale up to much greater heights than today's SMP sys-

tems, and SMP remains the best bang for the server buck.

IS shops continue to experience a growing need to consolidate PC servers and manage more desktop resources from a single server. Massively parallel technology is unlikely to fill this need any time soon, and SMP to date has been sharply limited in the sizes it could attain.

Sequent's goal is to arrange multiprocessor nodes in parallel but treat the memory on each node as shared memory. That way, an application will run on a Sequent server as if it were addressing a common pool of memory rather than forcing the application to be parallelized.

The Beaverton, Ore., firm is a key corporate ally of Intel and has had a lot to say about how the next-generation Pentium Pro was designed. It features 256K bytes of high-speed, Level 2 cache alongside the CPU in each chip module, a feature that

aids server design.

Sequent is likely to be among the first vendors to make scalable use of the four-way Pentium Pro units. These are not Intel motherboards with four processors, as is sometimes reported, but complete systems with power supplies, backplanes, I/O and daughterboard slots. Four-processor SMP machines can be built from them. However, the real challenge is configuring this building block into nodes that function with the scalability of parallel hardware but still look to the operating system like a shared memory system.

As Sequent engineers well know, the more processors you

load into an SMP

server, the more traffic you get on the internal bus. Managing that traffic is one of the stumbling blocks of large-server design. Sequent will pump traffic between processors over a backplane, which is dubbed the IQ Link.

Because Sequent places gallium arsenide "data pumps" on the IQ Link, data will move between processors at the rate of a gigabyte per second. Adding processors adds more IQ Link interconnect cards and more bandwidth of data transfer capability, up to 32G byte/sec. The high rate of speed along with special caching algorithms fool the operating system into viewing the separate processing nodes and their cache memory as a pooled resource. The nodes are arranged in parallel, but the application and operating system will address them as if they are running with a shared pool of memory, as in a

standard SMP design.

Sequent is unlikely to be the only computer vendor capable of tying together Intel's four-way units, but it has rich experience in dealing with the data transfer issues. With the birth of SMP nodes, arranged in parallel, the age of the consolidated PC server will bloom and assume broader tasks within the enterprise.

I commented in this space Oct. 9 that IS shops should move to Microsoft's NT Workstation and negotiate the price difference between it and Windows 95, drawing this reader response:

NT is clearly the appropriate enterprise desktop operating system. However, we have had zero success in getting the Microsoft representative to cajole their marketing people into providing upgrade pricing from Windows 3.1 (or Windows for Workgroups or even competitive upgrade pricing from OS/2).

Babcock is *Computerworld's* technical editor. His Internet address is charles_babcock@cw.com.

The Meta View



With Sequent's upcoming line, the age of the consolidated PC server will bloom.

Inside Lines

No paradise at Paradyne

Loyal and longtime AT&T Paradyne employees were dejected about AT&T's decision last week to put Paradyne up for sale. AT&T acquired the unit in 1989 and has seen it develop a series of innovative technologies since then. But Paradyne employees aren't thrilled about the "new" AT&T, formed when the company separated into three units just weeks ago. One longtime AT&T Paradyne employee who was told that AT&T will block employees from transferring to other AT&T units said, "Friends and family? I think that's the other long-distance company."

What's a few chips among friends?

The spirit of intramural cooperation mandated by Lou Gerstner is being put to the test as IBM tries to straighten out its muddled 64-bit PowerPC plans. Sources said options include continuing with the delayed PowerPC 620 chip; substituting a more advanced design; or handing the lead role to the AS/400 division, which already developed its own 64-bit PowerPC offshoot. The AS/400 chip is supposed to become a general-purpose device in its next incarnation, code-named Apache and due out in 1997. The debate is sparking quite a turf battle inside IBM, said an analyst close to the situation.

Firewall fortress

Look for Oracle in Redwood Shores, Calif., to announce an alliance this week with seven vendors of firewall software. A firewall protects confidential da-

ta when a site makes its relational database management system a public World Wide Web server.

Back in the game at last?

Three years after Sun Microsystems' SuperSPARC workstation made its debut, the 60-MHz chip trails the pack of RISC chips from competitors IBM, Hewlett-Packard, Digital and others. Sun hopes to turn that around on Nov. 7 with the splashy announcement of a Unix workstation line based on new 64-bit UltraSPARC chips.

The 5th Wave by Rich Tennant



NetWare manager ready

Novell will launch the next version of its ManageWise management software for NetWare networks this week at Enterprise Management Summit '95 in Dallas. Version 2.0 updates the NetWare management services with three types of integration [CW, July 10].

users.plenty.mad

A company called The Marketry in Bellevue, Wash., has started selling lists of E-mail addresses, and Internet users are none too pleased. The firm gathers addresses from various newsgroups, packages them under a subject area indicated by the name of the newsgroup and sells them to other marketing companies, according to a post in the Usenet group, comp.risks. One angry user advised people to protest via E-mail to The Marketry at listpeople@marketry.com. But, as another poster pointed out, doing so will only add fodder to the firm's lists.

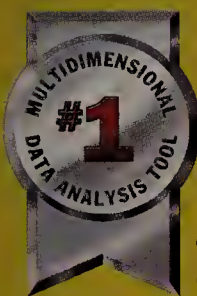
If you missed the 1938 radio broadcast, relive Orson Welles' spooky telling of the "War of the Worlds" over the Internet — just in time for Halloween. The story of a Martian invasion will play over a Web site sponsored by Los Angeles-based Web consulting company Internet Outfitters, starting Oct. 30. You'll have to download a free copy of Progressive Networks' RealAudio to hear the tale at <http://www.warofworlds.com>. Should space aliens invade your network before then, call Computerworld's 24-hour voice-mail tip line at (508) 820-8555 or our toll-free number at (800) 343-6474. News editor Maryfran Johnson can be reached by phone at (508) 820-8179 or via the Internet at maryfran_johnson@cw.com.



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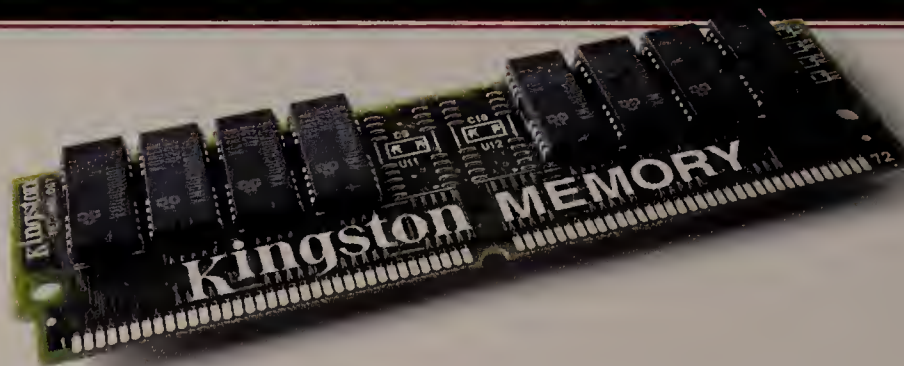
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